CHAPTER I
INTRODUCTION

INTRODUCING THE PROBLEM

Ageing is a natural phenomenon in human life. The processes that occur in humans during early stages of life are known as growth and development and the processes that occur during later stages of life are known as ageing in gerontology. Thus, study of ageing usually represents the study of elderly persons. The changes that occur from ageing are generally degenerative and affect both structural and functional properties of individuals (Srivastava, 2004). However, ageing is not only a biological process, it is very much conditional to or associated with various social, cultural, economic and environmental factors. It is obvious that all the factors affecting ageing are not static but ever changing with time. Consequently, the ageing process is affected in different ways through the changes of these factors or in other way it can be stated that the elderly are affected by these altered factors leading to introduction of manifold problems to the elderly (Srivastava, 2004).
“Gerontology” is the scientific discipline under which the phenomenon of ageing is studied. Encyclopaedia Britannica (Vol.20, 1990) defines it as the science of finitude of life expressed in the three aspects of longevity, ageing and death examined both in evolutionary and individual perspectives (Sarmah, 2006). Anthropologist Saran (1989) defined gerontology as the science of ageing and it relates to the problems of the aged male and female in a social group. The problems of gerontology fall into four groups –

1. Social and economic problems which emerge as a result of increase in the number of elderly people in the population.

2. Psychological aspects of ageing, which includes intellectual performance and personal adjustment.

3. Physiological basis of ageing, along with pathological deviations and disease process.

4. General biological aspects of ageing in all species.

The research agenda on ageing was developed by the United Nations Programme and the International Association of Gerontology in 2002 with the objective of contributing to clarifying and implementing public policies on ageing, and to give direction and priorities for scientific gerontology (Siva Raju, 2006). Gerontology is an interdisciplinary subject where biological and social sciences converge. The application from all these branches is expected to reduce the disabilities associated with ageing.

In the present day world, two major factors i.e., increase in life expectancy and decrease in fertility rate, are entirely responsible for an inevitable condition of demographic transition (Verma and Khanna, 2013). This demographic change is
characterized by two main trends - growing populations and ageing population. One of the most significant outcomes of population ageing is increase in old age dependency ratio. The ageing population is posing a challenge for the entire world. With the growing ageing population, wellbeing and quality of life of elderly person has emerged as a major concern both at the individual and the societal level (Ramakrishnan, 2011).

With the rapid and continuous pace of industrialization, urbanization and modernization, radical changes have been taken place in the society where the traditional reverence and integration of the elderly is gradually disappearing (Verma and Khanna, 2013). First the extended and joint family system is giving way to nuclear families, which is ever increasing. Children have to stay away from their old parents, primarily forced by economic necessities. In changing pattern of the family system, elderly are not only losing prominence in the family system but also losing emotional links with the family members. The family members are unable to give time to the old people. Earlier, grandparents could spend quality time with their grandchildren. But, due to drastic changes in school curriculum, grand children do not have spare time to spend with their grandparents.

The rising trend of migration of younger people from rural to urban areas for study and employment is leaving behind older parents in rural areas and increasing the problems of the elderly. The elderly have to cope as best they can, with poverty and failing health and nobody to care for them. Consequently, there are more numbers of elderly who need care and support than the number of children who can provide care and support. Thus, old age dependency ratio is increasing and potential support ratio (PSR) is decreasing (UNFPA, 2010).
The period of old age is characterized by social and economic insecurity, ill health and loneliness. But in the changing context of the society, these problems are more severe than ever. When they lose their spouse, friend, job, income or health which can never be replaced, it brings about intolerance, rigidity of attitudes, selfishness and suspicion in them. This shift in their psychological makeup put their living and adjustment in a society more difficult (Devi and Bagga, 2006; Singh and Misra, 2009). In rural areas, the lack of adequate health care facilities also worsens the elderly’s situation. Moreover, the technological advancements are so rapid and distinctive that the elderly cannot cope up with these. Under such circumstances the elderly are left alone and eventually they feel isolated and lives turn dull.

Populations both in rural and urban areas are growing older. However, in most countries, rural areas are facing a double demographic burden - they have higher numbers of both children and aged persons in relation to the numbers in the main working ages who are available to provide support to the young and the old (ICSW, 2010).

In the present time, all these situations are prevailing in India; therefore, study of ageing in the elderly is now a prioritized area which will help the government in making plans and policies to resolve the problems of elderly.

**DEFINING AGEING**

The process of ageing is defined by many scholars from their own point of view as well as it is also studied from different angles. However, the meaning and understanding of ageing is always the same. Generally ageing is referred to as the sequence of life events across life span (Eisdorfer and Cohen, 1980). The Encyclopaedia
of Human Biology (Vol. 3, 1991) defines ageing as time dependent biological changes occurring throughout life span and leading ultimately to death. Ageing is defined by World Health Organization (WHO, 1990) as the process of progressive change in the biological, psychological and social structure of individuals (Sowers and Rowe, 2007). Chamber’s 20th Century Dictionary (1985), defines ageing as the process of growing old, on developing qualities of the old, maturing and aged organism.

Harris (1980) is of opinion that ageing begins when growth and development stop. Anantharaman (1982) defines ageing in terms of the regularities or events, which occupy significant position of the life span resulting in difference between younger and older individuals in structure and function.

Davidson (1984, cf Devi and Bagga, 2006)) opines “ageing comprises of those fundamental changes not due to disease occurring in individuals after maturity which are more or less common to all members of the species and which increase the probability of death. Ageing is thus the increasing inability due to death”.

Borkan et al., (1982) define ageing as “the sum of changes which occur primarily in the post reproduction period, which are the characters of an individual in a population and which as whole, decrease the functional capabilities of the organism and render death increasingly probable”.

Different scholars define ageing from their own point of view but there is not a single definition which can explain all aspects of ageing process. Some features of ageing can be summarized as follows –

1. The process begins after the attainment of maturity.
2. The changes occur with ageing are inevitable and irreversible.

3. They are genetically programmed in the human system.

4. Ageing brings about a decline in adaptation of the organism to its normal environment.

5. Diminished adaptation leads to loss of viability and the increase in vulnerability to disease (Sarmah, 2006).

AGEING POPULATION - A WORLD OUTLOOK

The demographic transition commonly known as ‘greying of nations’, is posing a challenge for the entire world (Bagchi, 1996). In most advanced countries, the process of ageing population began before the World War II. However, the developing countries are experiencing such change since the last few decades of the 20th century only (Sarmah, 2006). The United Nation reports (World Population Prospects, 2015) on Population and Population Projections point out that now-a-days the median age for the world is 28 years. In the upcoming four decades, the world’s median age is expected to increase by ten years, to reach 38 years in 2050. In 2000, the population aged 60 years and above was 600 million which is triple the number present in 1950. In 2009, the number of aged persons exceeded 700 million. By 2050, the number of aged population is projected to become 2 billion, indicating that their number will once again triple over a period of 50 years. Globally, the aged population is growing at a rate of 2.6% per year, a rate notably faster than the population as a whole, which is increasing at 1.2% annually. The number of people aged 60 years and over as a proportion of the global population will double from 11% in 2009 to 22% by 2050. By then, there will be more over-60 population than children of under-15 population for the first time in human
history (Keating, 2008). The rate of population ageing is faster in developing countries than in developed countries. Accordingly, developing countries will get lesser time to adjust to the effects of population ageing.

AGEING POPULATION - AN INDIAN SCENARIO

India is also in a rapid trend of changing demography, experiencing an age structural transition which is a shift from young to old age. Therefore, the demographers identified India as a country that is entering the ‘Age of Ageing’ (Cherian, 1999). The population aged 60 and above has tripled in last 50 years in India and will persistently increase in the near future. According to 2001 census report the elderly population of India accounted for 7.6 million. As per census 2001, older people were 7.7% of the total population, which increased to 8.14% in census 2011 (Verma and Khanna, 2013). The percent of aged male is 7.7, which is lower than the percent of aged female i.e. 8.4. In rural India the percent of aged population is 8.1 and in urban India the figure is 7.9 (Census 2011, provisional). The projections for population over 60 years in next four censuses are: 133.32 million in 2021, 178.59 in 2031, 236.01 million in 2041 and 300.96 million in 2051 (Verma and Khanna, 2013). However, a report released by the United Nations Population Fund and Help Age India recommended that India had 90 million elderly persons in 2011, which is expected to grow to 173 million by 2026. Of the 90 million aged, 30 million are living alone, and 90 per cent work for livelihood (Dhar, 2012). It is important to note that according to U.N., 1965, in a country if the old population is more than 7% of total the population, then it is called ‘aged population’ and India crossed this limit only during the decade 1991-2001.
Japan is the only country, at present, having more than 30 per cent of its population aged 60 or above. By 2050, sixty four countries will have older people that make up more than 30 per cent of the population. By 2050, almost 80 per cent of the world’s older persons will live in developing countries where China and India will contribute to over one-third that number (Dhar, 2012).

The life expectancy of Indians has been increasing steadily causing a major demographic shift from young to aged population. The life expectancy at birth during the year 2006-2011 was 65.65 and 67.22 for male and female respectively while predicted life expectancy at birth during the year 2011-2016 is 67.04 and 68.8 years for males and females respectively (Verma and Khanna, 2013). Another important factor affecting aged population in India is decline in fertility rate. The fertility rates in India have declined to 2.6 children per women from 5.9 children per women of the early 1950s (Haub and Gribble, 2011). The fertility rates is decreasing more in South Indian states like Kerela and Tamilnadu where the figure is as low as 1.7 children per women in 2009.

Due to rapid increase in aged population in India old age dependency ratio is also rising constantly. Old age dependency ratio (number of people above 59 to the people between 15 and 59) in 1961 was 10.09, in 2001 it was 13.1 and according to census 2011 it has reached to 14.2.

A World Bank publication *Old-Age Income Support in the 21st Century: An International Perspective on Pension Systems and Reforms*, (May, 2005) revealed that the developed world got rich before its people started living longer, but in developing
countries people are getting older before the countries have got rich. In the context of India this is very true making the issue of ageing rather critical (Ramakrishnan, 2011).

INDIVIDUAL AGEING

Like population ageing, ageing of Individual is also an important concept in ageing study. Individual ageing is a gradual process where human capabilities slowly and gradually decline. This decline shows a wide range of variation due to the influence of socio-cultural, environmental and genetic factors. For variation in responding this process, physical anthropologist include the study of ageing in its scope. The present study mainly focuses on individual ageing process.

CONCEPT OF AGE

An important concept is Age. According to Oxford Advance Learner’s Dictionary (2002), age means the numbers of years that a person has lived. In gerontology it has three dimensions and they are interrelated to each other. These are –

BIOLOGICAL AGE

It refers to the individual’s position along the life span, according to the level of development or deterioration of his or her biological organs and systems. Research on the biology of ageing is concerned with the study of the process that limit the life spans of species and individuals or with finding out why species and individual members of species have determinate lengths of life. Gray and Moberg (1962) stated that physiologically a person is old when the signs of wearing out of the body appear. There is no particular age when all the physical functions of a given individual begin to show a decline.
SOCIAL AGE

It refers to individual’s roles and habits in relations to other members of the society to which they belong. To the extent that a person shows the age graded behaviour expected by society, the person is judged to be older or younger. Social age is also judged on the basis of many behaviours and habits, such as style of dress, language and interpersonal style, etc. According to socio-cultural viewpoint, a person is termed ‘aged’ when he distances himself from those roles and statuses which he was performing as an adult or when he is unable to carry out some important social functions (Havighurst, 1961). For example, the progression through family roles from being single to married and to widowhood, from parenthood through empty nest to grand-parenthood, provides markers for the definition of the individual as young, middle and aged or old.

PSYCHOLOGICAL AGE

Psychological age determines the behavioural capacity of individuals to adapt in changing environmental demands (Birren and Cuningham, 1985). It confers prime significance to the adaptive capacities, i.e., how well an individual adapts to changing environmental stress or demands with the average of his groups. It refers to the position of individuals relative to some population with rapid to adaptive capacities as observed or inferred from measurement of behaviour. Psychological age may also include subjective reactions to development. Although psychological age is related to both chronological age and biological age, it is not fully accounted for by the combination of these.
PROCESS OF AGEING

Ageing represents a peculiar phenomenon in human being; it involves at least three distinct processes. They are the primary, secondary and tertiary ageing (Birren and Cunningham, 1985). Primary ageing refers to the normal disease free movements across adulthood. Secondary ageing refers to the developmental changes that are related to disease. The progressive loss of intellectual abilities in Alzheimer’s disease is an example of secondary ageing. Finally, tertiary ageing refers to the rapid losses that occur shortly before death.

The process of ageing can be studied and understood from three aspects—physiological ageing, social ageing and psychological ageing. These are simultaneously interactive and independent throughout life.

BIOLOGICAL AGEING

According to Handler (1960), biological ageing is a deterioration of a mature organism resulting from time dependent, essential irreversible changes intrinsic to all members of the species such that, with the passage of time they become increasingly unable to cope with the stresses of the environment thereby increasing probable death. Biological ageing refers to the bodily changes that occur in later part of life of an individual. Generally the changes which occur in physiological ageing is visual or phenotypic; skin becomes wrinkled, hair becomes gray, tooth falls in old age, etc. Apart from these visual changes, some other changes occur inside the body, which are not phenotypic. Such types of change occur in immunological system, cardiovascular system, digestive system, etc.
SOCIOLOGICAL AGEING

It is a process by which a person acquires superior knowledge and takes up responsibilities and roles depending upon its age-status in the society. According to Tibbitts (1960), sociological ageing is concerned with changes in the circumstances or situations of the individuals as members of the family, the community and society. It refers to the changes in the individual changing circumstances that include completion of parental roles, retirement from work, reduced income, onset of disease and disability and need for support.

PSYCHOLOGICAL AGEING

Psychological ageing deals with the evolution of adult behaviour over the life span of individuals, which includes capabilities, skills, feelings, emotions and behaviour. Birren and Renner (1977), the well-known psychologists, refer to ageing as the sum of regular changes that occur in mature genetically representative organisms living under representative environmental condition as they advance to chronological age. More often psychological pressure or disturbances bring people to look aged and it is reflected in body as an unnatural process. It also includes attitudes and behaviour of others towards the old. It also refers to adaptive capacities of a person in a changing environmental condition. In other words, it refers to personality changes occurring as a part of the ageing process. For example, as age advances there is a decline in the intellectual process and short-term memory (Botwinick, 1977) and certain intellectual ability (Ramamurti, 1988).

None of the above mentioned perspectives is able to describe ageing absolutely; instead each of them represents a particular perspective. The biological approach links
ageing with the change in role performance with the decline in physical health while psychologists consider it with the decline in mental health. Sociological approach is coupled with the expected norms and values of a particular society. Thus, ageing is a normal process where these three phenomena interact and the interrelationship of these aspects determines the level of individual to a great extent.

These three aspects are also influenced by a large number of factors like demographic, economic, social, cultural, etc. The process of growth and development of one’s life interacts with disease and ageing to produce age related variants, functional decline or clinical pathology. Ageing is thus, an individualized response, which can be understood in the context of social, cultural, economic and psychological environment.

THEORIES OF AGEING

As ageing is a multidisciplinary endeavour, each discipline brings its own theories, models and concepts to explain aspects of ageing. Many theories have been put forward to explain all the complex processes of ageing that occur in cells and body. Strehler (1977) states that any theory of ageing must meet the three criteria: (1) the ageing phenomenon being considered must be evident universally in all members of a given species, (2) the process must be progressive over time, (3) the process must be detrimental in nature, leading ultimately to the failure of the organ or system. Some theories of ageing are given below-

BIOLOGICAL THEORIES OF AGEING

Biological theories of ageing explain physiological process and structural alterations in living organisms that determine developmental changes, longevity and
death of individuals. These theories can be broadly grouped into two: 1. Genetic

Genetic Theories: According to these theories, ageing is the result of a built-in
genetic programme that proceeds inevitably to senescence and death. The following
are some of the well known genetic theories on ageing.

Ageing Clock Theory: According to this theory, ageing is programmed in our
bodies. This theory propounds that ageing is programmed and is normal part of a
sequence leading from conception through development to senescence and finally to
death.

Cellular Theory: The theory deals with breaks in the chain of DNA molecule,
which results in the inability of the cell to manufacture essential enzymes. This would
result ultimate in the death of cell. This declining of cells is a sign that senescence
occurs at the cellular level which is programmed. It is “natural” for the body to grow old
as it is for the embryo or organism to develop to maturity.

Error Theory: This theory proposes that ageing and death are due to the
occurrence of errors in the synthesis of proteins. It explains ageing in terms of
alterations of information in DNA and RNA. Replication is subjected to an increased
number of errors, which lead to the accumulation of molecules that are unable to
support the cell’s metabolism (Natarajan, 1995). The body cells are damaged by random
events. This damage accumulates over time, which results in the abnormal synthesis of
enzymes and gradual decrease in protein synthesis, finally to the point of failure in the
process.
**Non-Genetic or Stochastic Theories:** According to these theories, ageing is the result of external events, such as accumulated negative effects of environment or factors that damage cells or body systems. Some theories, which fall into this group, are –

Wear And Tear Theory: According to this theory ageing is a programmed process of the gradual deterioration of various organs necessary for life and cells are continuously wearing out. The process is accelerated by harmful effects of stress factors, both internal and external, imbedding the deleterious by-products of metabolism. Basic metabolic processes of the cells produce various waste products, such as “lipofuscin” or “age pigment”, that continue to accumulate and cause a decrease in overall functioning. The combined effects of such damages to the cell contents with age, along with the increasing failure of cells to replace damaged components, cause cell death at higher rate in advanced age.

Immune System Theory: This theory suggests that the immune system becomes less functional as the individual ages, thereby leading to breakdown of the system. The immune system is designed to protect the living organism by generating antibodies, which respond to the foreign organisms, proteins, etc., and by the formation of special cells, that engulf and digest foreign cells and substances. According to this theory, the system eventually becomes defective such that it can no longer distinguish the body’s own tissues from foreign tissues. This could be the reason for the rising incidence of autoimmune diseases such as rheumatoid arthritis.

Cross-Linkage Theory: According to this theory ageing results due to the accumulation of cross-links in proteins. The theory states that the ultimate failure of tissues and organs occurs from irreversible ageing of proteins like collagen. Formation
of cross-links causes loss of elasticity with advancing age in many tissues of the body. Due to this, skin texture changes and results in reduced ability to stretch and flex.

Free-Radical Theory: This theory states that age-related changes occur as the result of accumulation of free radicals in cells beyond threshold concentrations. Free radicals are self-propagating; thus the number rapidly multiplies and cause increased damage to the cell. Free radicals may exist only for very short periods, one second or even less and may also induce mutation in chromosomes, thereby causing damage to normal genetic mechanism.

SOCIAL THEORIES OF AGEING

Social scientists have developed a number of theories relevant to ageing and adjustment. Some of the social theories of ageing are:

Disengagement Theory: With the increasing age, an individual moves from social interaction to a more individualised interaction. According to this theory, both the individual and the society are pleased by this normally satisfying disengagement process. There are two types of disengagement-social disengagement and psychological disengagement, and one may occur without the other.

Activity Theory: The theory basically describes that successful ageing and adjustment can be accomplished by maintaining the activity patterns and values characteristic of middle age in old age. Majority of the normally ageing persons will continue reasonably constant level of activity where the amount of activity will be influenced by past life styles and socio-economic factors rather than by some inherent foreseeable process. In addition, the correlation between the social system and
personality system remains constant to a large extent as individual moves from the status of middle age to old age.

Continuity Theory: This theory is based on the principle that the different stages of the life cycle are distinguished by a greater extent of continuity. This theory does not see old age as a distinct period of life but as a continuation of some patterns or responses set earlier, particularly coping strategies of acting, thinking and feeling. This theory claims that people may also change their reaction towards ageing adapting to new situations.

PSYCHOLOGICAL THEORIES OF AGEING

These theories are often considered as the extension of personality and development theories into the middle and late life. These theories attempt to explain the contradiction reported in the disengagement theory and activity theory. Some theories, which fall into this group, are– Life span development theory and Self-fulfilment theory.

As there are many facets to ageing, there are a number of theories to explain one or many aspects of ageing. Yet, there is no single theory that explains all the phenomena of ageing.

LITERATURE REVIEW

Study on ageing has gained importance due to two factors. One of them is the general increase in life expectancy due to the advancement made in the field of public health and secondly due to population ageing. The perception of old age as “problem” for western countries appeared in early 20th century (Achenbaum, 1996). The term
"gerontology" was introduced in 1903 by Elie Metchnikoff and the term “Geriatrics” was first coined by Dr. Nascher in 1907.

As gerontology is a multidisciplinary subject, many scholars have studied it from various angles such as biological, social and psychological aspects and different literature revealed the importance of ageing study. Earlier, scholars did not give much attention to this field. One of the earliest trends in research is the study of the elderly and how they adjusted to these problems. One of the very early literatures on the biology of ageing is by Alex Comfort. His book *The Biology of Senescence* (1956) deals with most areas of ageing like explaining the ageing process, the different forms of senescence and the theories relating to ageing. Hulicka (1975) conducted an empirical study, the findings of which were incorporated in his *The Psychology and Sociology of Aging*. It is purely a quantitative analysis, which clearly analyzes demography, intellectual functioning, perceptual functioning, learning, memory, problem-solving and creativity, life satisfaction and adjustment to ageing, work and retirement. This work discusses how the process of ageing and behaviour of older people are connected.

**POPULATION AGEING**

In the decade of the 1980s, analysis of populations for the future regarding the impending ageing of the Indian population alarmed the demographers and many studies appeared in this regard. Such studies have since then grown in number with the ever increasing emphasis on rapid demographic ageing in India and other developing countries and its impending economic and social consequences. This concern was increasingly being voiced by international agencies such as World Bank and WHO, and may have stimulated studies in this regard. Basu and Basu (1987), in one of the earliest
such works, described the concept of demographic ageing and suggested some statistical measures to assess the extent of ageing in population through analysis of census data.

The need for information, specifically on the elderly, was felt and consequently NSSO first organized a comprehensive survey on the socioeconomic status of the aged in 1986-87 in its 42nd round. This was followed by a second such survey in its 52nd round in 1995-96. The nation-wide survey collected information on the number of living children, living arrangement, economic status, number of dependents, health and disability status and the familial status and role of the aged in India. These surveys are a part of the decennial programme of surveys of the NSS. The information provides the most comprehensive set of secondary data on the socio-economic status of the aged in India and enables comparison of inter-state trends in the same.

Chanana and Talwar (1987) discussed the population projections of the year 2000 for the states of India and identified the states facing major future problem of ageing. Rajan (1989) discussed the ageing problem in Kerala, which was the first state to face the phenomenon of population ageing. The growing proportion of aged population faces the problems of economic insecurity, very high rates of morbidity and emotional insecurity due to the absence of family support in many cases caused by out-migration of younger members for reasons of employment.

Soodan (1975) in his book *Aging in India* investigated about the aged population in the city of Lucknow. His demographic analysis shows gradual increase in the number of the aged. He compares the educational level, the age of migration to the city and their economic dependence. He found that the majority of the aged spend their free time
doing odd jobs connected with household work, looking after children and ‘doing nothing’. Free time pursuit of men was solitary in nature, while women spent free time in interpersonal activities.

Various studies appeared after the 1991 census containing an analysis of the census data on the state of India’s elderly and deriving inferences from it. Dandekar (1996) presents an exhaustive demographic account of the number of aged (above 60 years of age), their work participation rate, literacy, marital status, dependency ratio and other characteristics using the 1991 census data, and the NSS data of 1986-87. In the second part of her work she analyses 14 old age homes from across Maharashtra outlining the facilities available and the problems faced by the elderly. Finally she presents an analysis of sample data from a survey of eight villages in Maharashtra covering 601 old people. She found that traditional support system of family was still dominant in the majority population surveyed, though income insecurity was the major problem leading to loss of status in the family.

Thorson (2000) in his book Aging in a Changing Society tries to figure out the massive population shift, which the world is experiencing, as a revolution unprecedented in human history. Not only the number of older people has been increasing, but the ways in which different generations see the world have been changing as well. The physical as well as the psychological process of ageing and the health care system are well explained in the book. The topics are more applied than theoretical.

In 1999, Rajan et al., in their publication Indians Elderly: Burden or Challenge? presented a comparative account of the elderly in India. This study explores the
widespread feeling that the elderly are becoming a burden in Indian society. It is a
demographic survey that cautions us about the implications of increasing elderly
population in a developing country like India. The statistics of social conditions,
economic conditions and the available social policies are meticulously presented in the
book. For the authors, the situation in general is worse for the female elderly compared
to their male counterparts. In the same year, Sundari and Geetha (1999) present a
demographic profile of the aged with special reference to women. Bose (2000) presents
the demographic transition and highlights in his study *The Emerging Demographic
Scenarios* based on the latest data generated by the Census of India, NSSO and relevant
United Nations Publications.

**BIOLOGICAL ASPECTS OF AGEING**

Size and proportion of human body show a declining trend as one becomes old,
but it shows variation. Anthropometric change with age is one of the aspects of ageing
studies. But there is little anthropometric information available on the elderly, especially
in developing countries. Barbosa et al., (2005) worked on gender and age-specific
selected anthropometric data for a representative sample of elderly Brazilians in the city
of Sao Paulo. The observations suggested that there is loss of muscle mass and
redistribution and reduction of fat mass with age (both genders). Another work by
Lopez et al. (2011) applied a gender perspective to establish some of the anthropometric,
body composition, health and socio-cultural determinants of active ageing. Borkan et
al. (1982) reported that some anthropometric measurement decreased with age and
increased in biliac breadth, bigonial breath. An increase in body weight through the age
55 and a gradual decline is observed in males while females peak at a later age and
decline more slowly. Borkan and Norris (1980) carried out a profile of 224 age related physical parameters to access biological age and found an association between physical activity and ageing. They concluded that physically active men were more youthful than inactive men.

Studies on health status of the aged in India have been few and far between. Several studies discussed here are based on primary surveys of aged population. Most of the studies are clinical in nature and focus on the prevalence of morbidity among the aged but are lacking in the essential linkage between the socioeconomic status and morbidity profile of the elderly.

Purohit (1973) conducted a survey of two villages of Jaipur district in Rajasthan in the year 1973. The results showed that 61% of the aged were ill at the time of the survey. The most prevalent health problem was bronchitis, followed by anemia, cataract, deafness, prostate enlargement and a vitaminosis. The author found a very high rate of 4.3 illnesses per person reporting illness among the aged.

Dey et al., (1993) discussed the major health problems faced by the elderly in India through an analysis of the data on morbidity among the aged compiled by the NSS survey of 1986-87. The authors listed out the major diseases suffered by the aged as those of vision, locomotion, central nervous system, cardio-vascular system and psychotic disorders. Prevalence of chronic diseases was as high as 45% in the surveyed population. They, however, did not discuss the inter-state trends in old age morbidity. The goal in health care for the elderly according to the authors is to maximize functional independence and not definitive diagnosis and cure; the importance of rehabilitative measures is stressed for that purpose.
Shah and Prabhakar (1997) in their study on chronic morbidity profile among the elderly have utilized the data available from the ICMR studies conducted at different time periods for various chronic disorders. The data shows that hearing impairments and vision disorders are the most common health problems of the elderly.

To evaluate geriatric nutritional status anthropometric variables are considered as essential features as they relate to age and gender. Several recent works focused on age variation in anthropometric character and nutritional status of aged population (Datta Banik, 2009; Medhi et al., 2006; Bose et al., 2006).

Nutritional status is also an important field of study, though studies on nutrition levels among the aged have been fewer still. Some studies were based on primary surveys, while some others used the NSS and NNMB information as their base. Khanna and Puri (1999) studied the nutritional status of women from rural and urban areas of Delhi by using the 24-hour recall method, and the health profile was measured using a questionnaire to assess the respondent's functional ability. The results arrived at were predictable- women in rural areas belonging to lower middle class suffered the worst health status while females from the upper middle class in urban areas ranked at the top.

Wadhwa et al., (1997) compared four different sets of data on nutritional status of the elderly; data sets include NNMB surveys of 1990-91, and sample surveys undertaken by the authors in Delhi. The authors note a distinct difference in food consumption pattern in rural and urban areas, and consequent variations in nutritional status. The major nutrient deficiencies in urban areas were those of calcium, iron and vitamins, while in rural areas chronic energy deficiency is the major problem. The study
notes a declining pattern in consumption of cereals and milk products with increase in age in rural areas.

Saikia and Mahanta (2013), in their study, assessed the nutritional status of elderly above 60 years of age in terms of body mass index (BMI) living in urban slums of Guwahati and studied the factors related to nutritional status. The study revealed that the prevalence of under nutrition (BMI <18.5) was found to be 22.2% and over nutrition which includes overweight (BMI ≥25-29.99) and obesity (BMI ≥30) was 12.5%. Significant association was found between nutritional status, socio-economic status and number of major meals a day. No significant relationship could be elicited between living status and nutritional status. In 1982 Waldron and his associates also studied ageing in relation to the health of the elderly. In a sample of adults aged 84 years, they studied cross-cultural variation in blood pressure, BMI and available salt composition in their food. The study analyzed the relationship of cross-cultural variation in blood pressure to cultural characteristic, salt consumption and body weight.

Vijayakumar et al., (1992) conducted a survey in Thiruvananthapuram city, Kerala to assess the health and functional status of the elderly. The women were found to be poorer suffering a lot having more morbidity than the men, in spite of their greater life expectancy (Sarasa Kumari, 2001).

Rao (2003) in a study of health status of the rural aged in Andhra Pradesh, found that health problems tend to increase with advancing age and very often the problems aggravate due to neglect, poor economic status, social deprivation and inappropriate dietary intake. A high proportion of the total respondents stated that they were suffering from illness seriously. According to researchers, lack of medical facilities in the village
and poor economic conditions might be responsible for the low health status of the villagers (Kusuma, 2015). These findings were supported by the findings of Singh (2005) in his study in rural Haryana. Hence, majority of landless rural aged were suffering from one or the other health problems and physical disabilities.

Dzuvichu (2005) mentions that health is not only a biological or medical concern but also a significant personal and social concern. In general with declining health, individuals can lose their independence, lose social roles, become isolated, experience economic hardship, be labelled or stigmatized, change their self-perception and some of them may even be institutionalized. Achir (1998) shows that although changes are good indicators of development, dilemma for support capacity of the family towards the elderly is inevitable. With many women entering the work force, available support for the elderly has significantly reduced. As a consequence, the International Year of the Family has appealed to the world to maintain, strengthen and protect the family to ensure continuity of its vital role in preserving dignity, status and security of its ageing members. Pappathi and Sudhir (2005) in their study of the aged rural females found that a majority suffer from joint pain, blood pressure and chest pain. A few complaints of asthma, piles, loss of weight, diabetes and skin diseases were also detected. Only 30 per cent among the rural aged were in good health.

Vasantha (1998) found that the rural aged suffered from nutritional, psychological and other problems, when compared to the urban aged. The aged employed privately and those self-employed had more of health problems than not gainfully employed persons. In general, the male members were found to be literate, economically independent and had less physiological and nutritional problem when compared to the female counter parts. When literacy level, income level and
employment status improve, they seem to have better health. Nair (1989) found that the incidence and prevalence of chronic as well as non-chronic diseases are more in rural elderly, such as 1) respiratory diseases, 2) loco-motor illnesses and 3) blood pressure.

SOCIAL ASPECTS OF AGEING

There are some studies focusing on the socio-cultural factors and their impact on the life of the elderly. Malik and Singh (1992) studied age associated changes in adult stature of a cross sectional sample of 268 males and 396 females (age range (18-59 years) of 203 Punjabi Khatri families of high and low socio economic groups were estimated by partial regression coefficient of stature on age, controlling subschial height. The values of aging estimates indicate unequal developmental plasticity of the two sexes with respect to aging.

Individuals from traditional society when migrate to highly urbanized areas, experience the tendency of elevated resting blood pressure. These have been attributed to weight, fat and physiological stress associated with migratory life style (Weitz, 1982 cf Devi and Bagga, 2006). According to Crews and Macken (1982), increase in obesity, cardiovascular disease and adult onset of diabetes mellitus are associated with modernization.

Kumar (2003) gives an overview of the conditions prevailing among the aged in India. He tried to examine the rural–urban and regional variation in the problems of the aged. The influence of socio-economic status on various types of morbidity has also been discussed.

Victor (1987) presents ageing in modern society as a richly diverse experience. He covers the social aspects of ageing by incorporating three distinct aspects of ageing.
The first is the change in perceived identity as the individual progresses through life. The second aspect is the social context that defines ageing and seeks to understand the position of the elderly within the society. Third, the societal consequences of ageing. Peace (1990) discusses about the dependency, support and construction of ageing in its social aspects. The relationship of chronological age and definition of social and biological age is also described.

Singh (1991) has attempted to scientifically investigate the various sociological aspects of ageing in both the rural and urban areas. In the rural communities of India, the joint family system is still prevailing to a large extent and such families do not throw the aged to the mercy of the society. There the aged participate in productive activities as much as they can. So the elders in rural communities still enjoy a high status and play a major role in decision making. According to him, the aged in the urban area also enjoy a fairly high status in their families and the so-called problems are only a trend. The major problems arise due to the abrupt retirement from an occupation, which is considered as a normal phenomenon of modern industrial society. He concludes that the aged with higher education and economic status enjoy a leadership position in their families in both rural and urban areas.

Srivastava (1982) in his book *The Aged and the Society* compiled the outcome of a socio-economic study conducted in some selected areas of Delhi, covering a wide socio-economic spectrum. The study was carried out in order to identify programmers, services and assistance needed for utilizing the skills and experience of the aged so that they become more useful to society. Ramamurti (1968) studies the impact of socio-economic status on the adjustment of elderly. The study reveals that the higher income group people are better adjusted than the lower income group people.
Financial dependency in old age leads to tremendous pressure on aged persons. Therefore studies on economic condition of the aged persons are considered one of the major fields in gerontology. The economic problem of the aged was first focused by Mahajan (1987) in unorganized sector. He worked on Old Age Pension recipients in Harayana district and found that most of the respondents suffer from different forms of diseases and it restricted their functional ability and opportunity to work for earning. Another important emerging field in geriatric research is social security. Reddy (1994) describes four types of social security by the aged i.e., income, health, personal or physical and social and emotional. He discussed the different security schemes those are implemented for elderly people and he gave more emphasis on aged belonging to unorganized sector as they are more vulnerable. Thakor (1998) discussed the existing social security in India and its relevance in the present context. He also discussed various social security schemes such as Employees Provident Fund organization, Employees Family Pension Scheme, Gratuity, pension, LIC, GIC, etc.

Many studies give importance on the daily living arrangements of aged population as changes in living arrangements are likely to be associated with changes in the level of care and assistance received by the elderly. Rajan et al., (1995) explained living arrangements in terms of the type of family in which the elderly live, the headship they enjoy, the place they stay in and the people they stay with. Despite the decline in the traditional values and the fact that it is becoming harder for elderly people and their children to live together, most children still carry a sense of obligation to take care old parents. Living with the eldest son is the most preferred choice and living with daughter is least preferred. Living with a married daughter was chosen only when the
parents had no sons or the sons had moved away. Living in old age homes was the least preferred choice (Prakash, 1999; Rajan et al., 1999).

Bond et al., (1993) indicate that the living arrangements of older people are strongly influenced by their structural position in society at earlier stage of the life cycle, which means that our lives in later life are strongly marked out by our access to resources and social goods throughout our lives. They found that admission to institutional care is often regarded as an inevitable consequence of frailty in later life.

Vijayakumar (1991) examined the health status of the elderly, aged 60 and above in relation to their marital status and living arrangements. The study was based on the assumption that changes in the family system had left the elderly in a neglected state. The study was done among 200 randomly selected samples from a rural sector in Chittoor District. Significant difference was observed in the health status of the aged living in joint, nuclear and post-parental families. When compared with their counterparts in nuclear and post-parental families the aged in joint families were getting better personal and health care from their family members.

Tran (1991) examined the relationship between family living arrangements and social adjustment among a sample of 258 elderly Indo-Chinese refugees aged 55 years and above in the United States. The findings revealed that the elderly who lived within the nuclear or extended family had a better sense of social adjustment than those living outside the family context. The elderly who lived in overcrowded households and in households that had children under the age of sixteen experienced a poorer sense of adjustment.
PSYCHOLOGICAL ASPECTS OF AGEING

One of the closely related problems of the elderly is their mental health which is affected by the unwelcome changes in old age insecurity, loneliness, loss of status and power and anxiety. In some studies the elderly manifested depression, dementia, suicidal tendencies and other psycho geriatric symptoms. Malik (1997) studied psychological wellbeing and life satisfaction among retired persons. The results revealed that the duration of retirement did not affect psychological wellbeing and satisfaction of the subjects.

Numerous studies have proven the relationship between depression and ageing. Even though features of depression and ageing are quite similar, chance of committing suicide is higher in a depressed person more than ordinary aged person. Likewise, depressed person is more liable to have other symptoms compared to somebody going through ordinary normal ageing. In some other studies, depression is described to have negative impact on person’s reasoning ability leading to inability to cope or adapt to the new challenges. When this occurs, symptoms like unstable mood, loss of social interaction, looking down upon one-self, self-attack, etc. will start forming. Age is reported in many articles to have a strong relationship with depression (Heun and Hein, 2005; Thielke et al., 2010).

Depression, loneliness and pain are inter-related and can occur at the same time to disturb an elderly person, people that suffer from depression complain more about pain. Meanwhile, loneliness was found to worsen depression among the old people in Korea and Japan (Gagliese and Melzack, 1997; Kim et al., 2009).
The Indian Council of Medical Research organized an Indo-UK workshop on public health implications of ageing in 1993 which discussed several psychological problems of the aged. Sinha et al., (2013) tried to estimate the prevalence of depression and assess association between socio demographic parameters and depression among older adults in a rural Indian community.

India is a fast developing country where the degree of modernization and rapid economic growth affect the status of the elderly. India has the second largest number of old people in the world as the elderly are the fastest growing age group. The main focus of Indian literature consists of suggestions to cope with the ageing scenario. Some of them are creative approaches towards understanding problems of the aged and planning for their rehabilitation. Most Indian writings are on the population explosion of the greying generation, which is also a global issue of the present century.

In North Eastern part of India, works on ageing is still in initial stage. There are only a few works done in this area considering the ageing problem from social, psychological and demographic aspects. Nagi (2004) studied the problems of the aged in Angami Naga society. Aier (2004) studied the status and role of elderly women in Naga society. In 1997 Devi and Bagga studied some aspects of ageing among the Manipuri people. Sarmah (2006) undertook a study on “The Aged in Assamese Society: A Study of Bio-social Aspects of Ageing in the Urban Context of Guwahati” considering both biological and social aspects. This is the first study on ageing in North East India considering both biological and socio-psychological problems of the aged. A book entitled Ageing in North East India Nagaland Perspectives- Vol.2, edited by A. Lanunungsang Ao (2007), deals with a number of issues pertaining to the aged from a
multi-disciplinary approach emphasizing on the status, welfare and problems of the elderly persons particularly in Nagaland.

**SCOPE OF THE STUDY**

It is now well established from extensive investigation that the increasing elderly people can impact on various socio economic aspects as this segment of population is associated with multiple physiological and psychological vulnerability. In the traditional Indian society, old people have enjoyed honour and authority as per the norms and values prescribed in our tradition. However, this segment of population faces numerous problems because of the fundamental changes taking place in its social structure due to a complex web of interlocking factors like westernization, industrialization, urbanization, mobility of younger generation and employment of women outside the home and technological progress.

Studies on ageing has been going on for sometimes now in different parts of the globe throwing light on the high degree of variability in age related problems. In India, studies on ageing, so far, has been the prerogative of demographers, sociologists and psychologists. The emerging problem of population ageing and the means to deal with the same gerontological studies are rather comparatively of recent origin in Anthropology especially in North-East part of India. In NE-India, Sarmah (2006) for the first time investigated in detail the bio-social aspects of ageing in the urban context among the Assamese people of Guwahati. The objectives of the study were to examine the bio-social aspects of ageing against the backdrop of rapid urbanization, modernization, shift from the traditional occupation of agriculture, breakdown of joint family structure, growth in the education level, age selective migration of younger
generation and changing value system against older ones. However, a thorough study in the rural context is also essential to understand the ageing problems in this region (NE India).

It is evident that more than seventy percent of our population resides in rural areas, practicing agriculture as their main occupation and having joint family in their society. In an agrarian society the elderly people occupies a very respectable position, because the experience and knowledge of the elderly people are highly demandable. Besides, in a joint family, the elderly are surrounded by a number of kinship relations, which is beneficial for providing emotional as well as physical security to the elderly. In such circumstances it is expected to have lesser ageing problems in the rural conditions.

However, now-a-days in rural areas the traditional way of living has undergone considerable changes. Recent changes in the type, size and structure of families have caused some impact on elderly people. The joint families are collapsing, creating smaller nuclear families and losing their productive function. In both rural and urban India the family system is breaking down. This change has an impact on social and individual life. In such an altering situation, the older people are suffering largely. Naturally, the dependency, both physical and financial, tends to grow with age and the new trend of multifunctional change in the society adds to the severe situation of the elderly people.

As people grow old they can be excluded from social relationships, cultural and leisure activities, civic activities, services, neighbourhood, financial products and material goods. In rural areas ageing population can experience multiple forms of social exclusion. Rural aged are particularly disadvantaged in the accessing health care
services, due to remoteness or lack of proper transportation. Traditionally, rural older people are more likely to be at risk of poverty. Therefore, the problems of ageing in rural areas may become further complicated. Besides, in the process of rural-urban migration, mostly young and young adults are prone to migrate, leaving the aged people behind in the rural areas, causing more problems to them. Thus they face economic, social and emotional insecurity.

The rural aged people experience unique social and environmental challenges. Therefore, it is indeed the need of the hour to understand how the rural ageing population cope with the changing phenomenon. Considering all these situations, the present study has been undertaken to assess the bio-social aspects of ageing in a rural context among the Sonowal Karharis of Lakhimpur District, Assam.

Northeast India is home of a large numbers of ethnic groups. Each of them has their distinctive culture. In Assam, both tribal and caste people are living together since time immemorial. Such a situation helps in the process of acculturation. Sonowal Kachari is one of the most acculturated tribal groups of Assam. They are concentrated mostly in the districts of Tinsukia, Dibrugarh, Golaghat, Jorhat, Lakhimpur, Dhamaji and Sivsagar. Some Sonowal Kacharis also live in Arunachal Pradesh. In this investigation the Lakhimpur district is taken as the study area.

Sonowal Kacharis are Assamese speaking Hinduised tribal people. They speak Assamese for many years because they have been surrounded by Assamese caste population which plays a key role in assimilation process. They are traditionally agriculturist, having joint family in their society. Now-a-days, their traditional way of living has been changed to a considerable extent. Increasing level of education for both
the sexes as compared to the other tribes of Assam leads to their high occupational mobility leading to breaking down of joint family structure.

Besides, modernization, westernization and urbanization have also been gradually influencing the Sonowal Kachari's way of life leading to a transitory situation in traditional culture. Change in society is a natural phenomenon. But it creates problems when one generation accepts changes and others find it difficult to accept it. The changes are rapidly accepted by the younger generation where as the elders still adhere to the old social morals and values. Due to changes in social system, the elderly people are not getting their traditional status from society or individual, the aged themselves may be unable to cope with such a situation. This leads to the emergence of elderly problems.

Ageing can be researched from two perspectives, first, from the point of the aged themselves, as they have to cope with the biological, social and psychological aspects of ageing itself. Secondly, from the point of view of society, as the presence of elderly and their problems have profound effect on the structure and functioning of the society. This study, therefore, attempts to assess the inter-related biological, social and psychological, aspects of ageing among the Sonowal Kachari of Lakhimpur district in rural context.

OBJECTIVES OF THE STUDY

The present study aims at examining, the following biological, social and psychological aspects of aged population of Sonowal Kacharis of Lakhimpur district of Assam.
Social:

1. Socio-demographic profile of the population.
2. Living arrangement of the elderly.
3. Availability of care provider to the elderly.
4. Satisfaction level from their offspring.

Biological:

1. Assessment of age change with regard to the anthropometric measurements of weight, stature, mid upper arm circumference, waist circumference and hip circumference.
2. Incidence of disease among the elderly.
4. Self-assessment of health and its relation to age, sex, income and morbidity.
5. Functional status of the elderly through the activities of daily living (ADL).

Psychological:

1. Memory and its relation to age, sex and economic class.
2. Alertness and its relation to age, sex and economic class.
3. Depression level and its relation with factors like age, sex and economic condition.