International Journal of Humanities and Social Science Invention (IJHSSI)
ISSN (Online): 2319 – 7722, ISSN (Print): 2319 – 7714
www.ijhssi.org ||Volume 9 Issue 3 Ser. IV || Mar, 2020 || PP 08-14

Transformation of Age Sex Composition of Population of South 24 Parganas District, West Bengal, India

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ABSTRACT:
As a demographic phenomena age sex has significant inherently inter dependent relationship with births, deaths and movement of population over space and time. The proportion of people in respective age groups establish the fact whether the whole population is 'young' or 'old' in an area in the process of demographic transition. This paper portrays the age sex composition of population for three consecutive Censuses (1991, 2001 and 2011) by secondary sources of data obtained from District Census Hand Book of South 24 Parganas district which was formed on 1st March, 1986. The analysis of age sex structure finds the gradual shrinking in the base of population pyramid that explain about the falling birth rate. Urban area contributes a relatively mature population pyramid because of higher concentration of population in adults and working age groups compared to rural sectors. In spite of having higher proportion of female in the reproductive age groups, the number of births is lower that signify a relatively better socio economic environment of the district. The declining young population and accelerating adult population have shown consistent reduction of young dependency ratio, though old dependency ratio is showing slight upward trend.
KEYWORDS: Age Sex, Age Group, Fertility, Mortality, Dependency Ratio

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Date of Submission: 14-03-2020 Date of Acceptance: 31-03-2020

I. INTRODUCTION:

Age and Sex are very important demographic components which are usually represented graphically as a population pyramid. The United Nation has defined the age as "the estimated or calculated interval of time between the date of birth and the date of Census, expressed in completed solar years (United Nations, 1970). Clarke (Clarke, 1972) points out that births, deaths and movement of population are inherently inter-dependent and any change in one of these may influence the other two and it is through these variables socio-economic conditions of the population are determined. Many individual characteristics and aptitude like reproductive and physical ability; circumstances of employment, mental outlook and so on are changed with age. Both the sexes have different biological, social and cultural functions and role (Pressat Roland, 1978). When the birth rates are high and the proportion of children is higher relative to the old and median age, the population is called 'young population'. On the other hand, the declining birth rate increase the proportion of adults and median age and the whole population is regarded as 'old population'. Generally, births occur to women aged from 15 to 49. The rate of child bearing usually rises slowly between ages 15 and 20, then sharply between ages 20 and 30 and thereafter declines first slowly and then rapidly. A higher mortality is usually seen during infancy and it decreases in childhood years until ages 10 to 15 and then continues at a low pace until about the age 30. Both the sexes can migrate to any ages, though migration is particularly high among men of early working age (15-29) and women around the age of marriage (Mukherjee, 1976). The working age group (15-59) is biologically the most reproductive, economically the most productive and demographically the most mobile (Trewartha, 1969). Factors like age of schooling, enrolment of name in voter's list, marriage etc. are generally determined by age. Sex and age are also very important because they are the "visible indisputable and convenient indicators of social status (Thomlinson, 1965).The Expected role of any individual in the family and society is associated with sex and age, though these vary from one culture to another.

II. AREA OF THE STUDY

South 24 Parganas district, the largest and 2nd most populated district in West Bengal is located in the southernmost part of the deltaic plains of Bengal. The district is situated between 21º 29' 00" North to 22º 33' 45" North latitude and 88 º 03' 45" East to 89º 04' 50" East longitude. On the 1st of March, 1986, the southern part of erstwhile 24 Parganas was carved out separately to form a new district named South 24 Parganas. Kolkata and North 24-Parganas lies to its north and north east and Bay of Bengal to its south. The study area is constituted by twenty nine blocks, bounded by an International boundary with Bangladesh to the east. On the

west, the river Hooghly has demarcated the boundary proceeding from north to south separates it from the district of Howrah and East Midnapore.

III. OBJECTIVES

- To analyze the age sex composition of population for 1991, 2001 and 2011 Censuses.
- To find out inter decadal change by quinquennial age groups, gender and residence.
- To examine the temporal change of dependency ratio (young and old) of the district.

IV. DATA SOURCES AND METHODOLOGY

To investigate the transformation of age sex structure, secondary sources of data has been obtained from District Census Hand Book of South 24 Parganas: 1991, 2001, and 2011: Primary Census Abstract and many other relevant published reports and documents. The data so obtained have been analyzed through simple but meaningful mathematical measure like the percentage distribution and graphically presented as age sex histogram which is popularly known as population pyramid.

V. RESULTS AND DISCUSSION

Age Sex Distribution of Population, 1991

Age structure is most commonly studied by a simple mathematical measure like the percentage distribution and an equally simple measure like the age sex pyramid where age structure is depicted along the vertical axis and the horizontal axis represent male and female population separately in percentage.

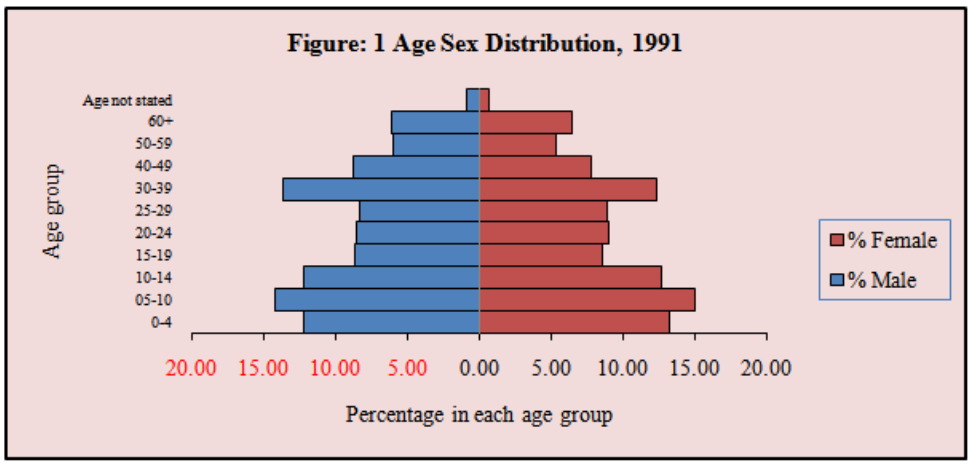
Table I: Age Sex Distribution of Population, 1991

Age Group	Rural			Urban			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
0-4	12.78	13.68	13.22	8.93	9.77	9.32	12.25	13.18	12.70
5-9	14.85	15.59	15.21	10.34	11.37	10.82	14.24	15.04	14.63
10-14	12.49	12.8	12.64	10.83	11.88	11.32	12.26	12.68	12.46
15-19	8.60	8.28	8.44	9.35	10.16	9.73	8.70	8.52	8.61
20-24	8.40	8.86	8.62	9.85	10.28	10.05	8.59	9.05	8.81
25-29	8.15	8.73	8.43	9.23	9.80	9.50	8.3	8.87	8.57
30-39	13.41	12.05	12.75	15.55	14.36	14.99	13.71	12.34	13.05
40-49	8.39	7.65	8.03	11.58	8.76	10.26	8.83	7.79	8.33
50-59	5.87	5.26	5.58	7.03	5.94	6.52	6.03	5.35	5.70
60+	6.15	6.41	6.28	6.25	6.78	6.5	6.16	6.46	6.31
Age not stated	0.91	0.69	0.80	1.06	0.90	0.99	0.93	0.72	0.83
All ages	100	100	100	100	100	100	100	100	100

Source: District Census Hand Book: 1991, South 24 Parganas; Primary Census Abstract, computed by the author.

The percentage distribution of population in various five year age groups indicates the number of persons in an age group if the total number of persons considered in 100. The age and sex histogram are popularly known as age sex pyramid. The Census of India (1991) has presented the age data in five years or more age groups like 0-4, 5-9, 10-14, 15-19, 20-24, 25-29, 30-39, 40-49, 50-59 and 60+.

Figure: 1 Age Sex Distribution, 1991



Source: District Census Hand Book, 1991, South 24 Parganas; Primary Census Abstract, computed by the author

A little shrink in the base of the population pyramid in 1991 (Figure 1) may be due to a declining fertility and also an increase in the proportion of the age group of the old and the median age, may be the product of falling birth rate. Both the male and the female population is higher in the age group of 0-14 years where the percentage of female child is somewhat higher than the male child which shows higher female fertility than male. Due to the advancement of medical facilities and health awareness, the infant and the child mortality tends to be reduced. The proportion of children in 0-4 year's age group has become double (12.70 per cent) than the old age group (6.31 per cent) (Table I). The young age group is economically unproductive and solely dependent upon the adult age group. The proportion of population in the young age group (below 15 years) is determined by the stage of demographic transition through which it is passing where larger proportion indicates first and second stage of transition (Chandna, 2005). The maximum percentage (14.63 per cent) of population is being observed in 5-9 years age group and the female old age population (6.46 per cent) is slightly higher than the male (6.16 per cent) which denotes higher life expectancy of old age female compared to the male. The percentage share of the female in reproductive age group (15-49) is 46.57 per cent. In the adults working age group (15-49), the proportion of male (54.16 per cent) is 2.24 percentage points higher than the female in 1991. The proportion of the younger adults (15-30) and the older adults (50-60) is relatively lower which indicates a higher dependency of the young and the old people upon working age group.

Rural and Urban Age Sex Distribution, 1991:

The proportion of female in the young age group (0-14 years) in rural areas (42.07 per cent) is higher than the urban areas (33.02 per cent) which may be assumed that there is an incidence of higher number of female birth in the rural areas than in the urban areas. But the reverse condition has been observed in the reproductive age group (15-49) where the proportion of females (53.36 per cent) in urban areas is higher than the rural areas (45.57 per cent) (Table I). In urban areas, the lower fertility as well as better care for the female are responsible for a higher concentration of female in the reproductive age group. The proportion of the total rural population from 0 to14 years age group is 41.07 per cent whereas in urban areas occupy only 31.46 per cent. The proportion of old age group is more or less similar in both the residential areas. Beside the child age group (0-14 years), all the upper age groups show a higher proportion of urban population than the rural because of the differential patterns of the socio-economic and cultural status.

Age Sex Distribution, 2001:

In 2001, the age distribution of population has been depicted in the pyramid at an interval of 5 years which shows a more detailed age sex structure compared to 1991 Census. This pyramid shows a broader base and narrower apex (Figure 2). Among the child age groups (0-14), the lower proportion in the lowest age group (0-5) presents a slight reduction in fertility.

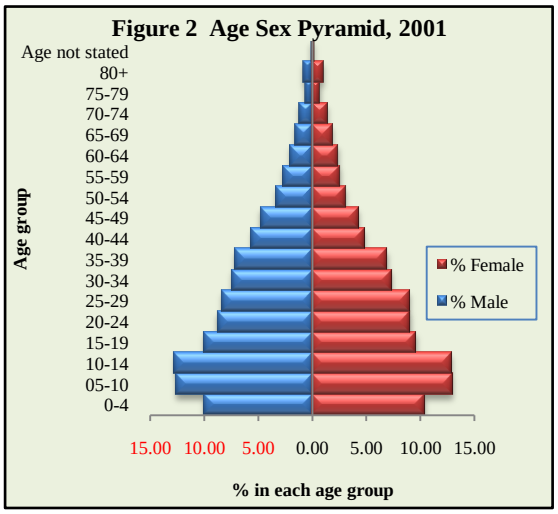
Table II: Age Sex Distribution of Population, 2001

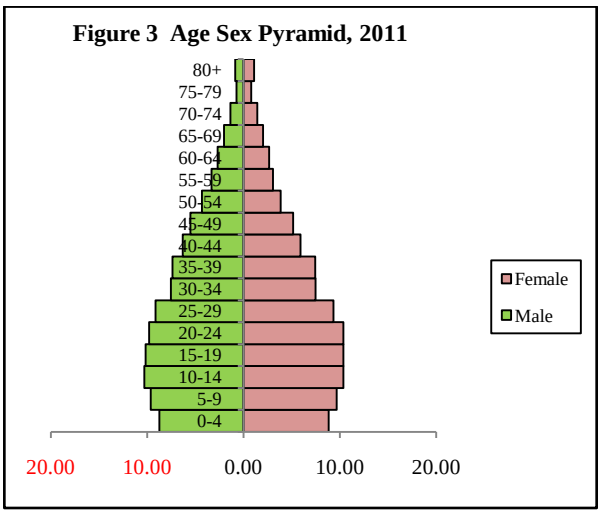
Age Group	Rural			Urban			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
0-4	10.51	10.83	10.67	7.24	7.62	7.42	9.99	10.33	10.16
5- 9	13.30	13.63	13.46	8.93	9.28	9.10	12.6	12.95	12.77
10- 14	13.16	13.25	13.2	10.38	10.63	10.50	12.71	12.84	12.78
15-19	10.11	9.55	9.84	9.53	9.64	9.58	10.02	9.57	9.87
20-24	8.68	8.93	8.81	9.34	9.78	9.55	8.79	9.06	8.92
25-29	8.24	8.72	8.47	9.02	10.09	9.53	8.36	8.93	8.64
30-34	7.18	7.10	7.14	8.54	8.58	8.56	7.40	7.33	7.37
35-39	6.94	6.62	6.79	8.31	8.45	8.38	7.16	6.91	7.04
40-44	5.37	4.62	50	6.96	5.88	6.44	5.62	4.82	5.23
45-49	4.53	4.08	4.31	6.09	5.15	5.64	4.78	4.25	4.52
50-54	3.12	2.94	3.03	4.51	3.70	4.12	3.34	3.06	3.20
55-59	2.55	2.48	2.52	3.43	2.91	3.19	2.69	2.55	2.62
60-64	1.99	2.30	2.14	2.61	2.64	2.62	2.09	2.35	2.21
65-69	1.52	1.80	1.65	1.90	2.06	1.98	1.58	1.84	1.71
70-74	1.20	1.35	1.27	1.41	1.50	1.47	1.24	1.37	1.30
75-79	0.63	0.69	0.66	0.72	0.79	0.76	0.65	0.70	0.67
80+	0.81	0.96	0.88	0.92	1.16	1.03	0.82	0.99	0.90
Age not stated	0.16	0.15	0.16	0.16	0.14	0.15	0.16	0.15	0.16
All ages	100	100	100	100	100	100	100	100	100

Source: District Census Hand Book, 2001, South 24 Parganas; Primary Census Abstract, computed by the author.

The maximum proportion in the age group of 5 to 14 years may be due to the lower child mortality in 0-5 year age group. Though, globally the chances of a child surviving to their fifth birthday are greater than ever before (Schellenberg, 2020). Like the population pyramid in the developing nations, the percentage

concentration of population has gradually decreased with the increase of age which causes the narrower apex of the pyramid. The relatively higher concentration (0.99 per cent) of female than male (0.82 per cent) in the age group of 80+ indicates a higher male mortality than the females (Table II). The proportion of population in the young age group of 0-14 years (35.71 per cent) and the old age group of above 60 years of age (6.79 per cent) in South 24 Parganas is somewhat higher in comparison to West Bengal where the proportion of population in the young and the old age groups are 33.30% and 6.60% respectively. Such condition may be explained by a relatively higher fertility and lower mortality of the district than the state.





Source: District Census Hand Book: 2001, 2011; South 24 Parganas; Primary Census Abstract, computed by the author.

Rural and Urban Age Sex Distribution, 2001:

The younger age group (0-4) always shows more female than the male (Table II) which indicates higher number of female child birth. But regarding the carelessness and the occurrence of death of the female child, the proportion is reduced in higher ages. The urban age-sex structure shows a higher level of concentration of population within the age of 10 to 39 years which indicates a relatively mature population pyramid where a significant number of people are found in the adults and working age group. In spite of having a higher proportion of female in the reproductive age group, the number of birth is lower, which is identified from 0-4 year age cohort. This entails a relatively better socio cultural environment in the urban area of the district in 2001.

Age Sex Distribution, 2011:

Maximum concentration of population (10.34 per cent) is being observed in the age group of 10-15 years and followed by 15-19 years (10.27 per cent) and 20-24 years (10.07 per cent) which denotes a sign of early mature stage of whole population structure (Table III). In India, the annual growth rate of old age (>60 years) population is higher than the total population's growth rate (Dhillon, 2013). The changing family structure increasingly affects the new cohorts of the elderly (Lutz, 2009). The district presents higher male population share than female above 65 years of age that further support about more male old age mortality (Figure 3). A traditional trend of relatively higher proportion of female is being found from 0 to 29 years of age which may be the sign of diminishing gender discrimination.

Rural and Urban Age Sex Distribution, 2011:

A spectacular boundary of age groups has been formed between rural and urban area in the study of age sex composition in 2011. Rural population contributes repeatedly higher proportion of people from 0 to 24 year of age (Table III) whereas urban population continuously occupy higher proportion from 25 to 80+ years of age which signify the differential residential maturity of district's population structure.

Table III: Age Sex Distribution of South 24 Parganas, 2011

	Rural Population			Urban Population			Total Population		
Age group	Male	Female	Total	Male	Female	Total	Male	Female	Total
0-4	9.21	9.37	9.29	7.40	7.34	7.37	8.75	8.85	8.80
5-9	10.16	10.24	10.20	8.07	8.06	8.07	9.62	9.68	9.65

10-14	10.76	10.89	10.82	9.00	8.86	8.93	10.31	10.37	10.34
15-19	10.48	10.67	10.57	9.26	9.47	9.37	10.17	10.36	10.27
20-24	9.97	10.41	10.19	9.31	10.21	9.75	9.80	10.36	10.07
25-29	9.17	9.16	9.17	9.10	9.82	9.45	9.15	9.33	9.24
30-34	7.31	7.17	7.24	8.22	8.42	8.32	7.54	7.49	7.51
35-39	7.08	7.10	7.09	8.23	8.37	8.30	7.38	7.43	7.40
40-44	6.00	5.64	5.82	7.21	6.71	6.96	6.30	5.91	6.11
45-49	5.21	4.88	5.05	6.38	5.93	6.16	5.51	5.14	5.33
50-54	4.04	3.61	3.83	5.07	4.48	4.78	4.31	3.84	4.08
55-59	3.13	2.93	3.03	3.86	3.48	3.68	3.32	3.07	3.20
60-64	2.56	2.57	2.56	3.12	2.95	3.04	2.70	2.67	2.69
65-69	1.95	2.01	1.98	2.21	2.11	2.16	2.02	2.04	2.03
70-74	1.29	1.40	1.35	1.55	1.56	1.55	1.36	1.44	1.40
75-79	0.70	0.77	0.73	0.84	0.84	0.84	0.73	0.79	0.76
80+	0.85	1.07	0.96	0.97	1.22	1.09	0.88	1.11	0.99
All Ages	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: District Census Hand Book, 2011, South 24 Parganas; Primary Census Abstract, computed by the author

Change of Age Sex Composition (1991-2011):

The important changes have been identified in three broad age groups (0-14, 15-59 and above 60 years) from 1991 to 2011. This is better demographic information that the proportion of working population has been increased by 5.80 percentage point (2001-2011) which was 4.34 percentage points from 1991 to 2001. The declining proportion of male in young (0-14) age group has become (2001-2011) double (-6.62) than earlier decade (-3.45) and female has followed more or less same trend in this age group which establish a remarkable reduction of fertility.

Table IV: Change of age sex composition of south 24 Parganas by broad age groups, 1991- 2001 and 2001-2011

Residence	Sex	1991-2001			2001-2011		
		Broad age groups (years)			Broad age groups (years)		
		0-14	*15-59*	*>60*	*0-14*	*15-59*	*>60*
Total	Total	-4.08	4.34	0.48	-6.92	5.80	1.08
	Male	-3.45	4.00	-0.08	-6.62	5.32	1.31
	Female	-4.78	4.56	1.09	-7.22	6.45	0.80
Rural	Total	-3.74	4.06	0.32	-7.02	6.08	0.98
	Male	-3.15	3.90	-0.26	-6.84	5.67	1.20
	Female	-4.36	4.21	0.95	-7.21	6.53	0.72
Urban	Total	-4.44	3.94	1.36	-2.65	1.78	0.82
	Male	-3.55	3.14	0.78	-2.08	0.91	1.13
	Female	-5.49	4.88	1.90	-3.27	2.71	0.53

Source: District Census Hand Book: 1991, 2001 and 2011, South 24 Parganas; Primary Census Abstract, computed by the author.

Both the sexes have experienced declining trend of proportion of population in 0 to 14 year of age group where reduction of male is more than female. In the working age group (15-59), the proportion of female population has been increased greater than male counterparts that explain the increasing trend of female working population than male (Figure 4). With the progress of medical care, the overall share of population in old age group (above 60 years) has become more than double from 1991-2001 (0.48 percentage point) to 2001-2011 (1.08 percentage point), though the status of male has been increased to some extent than female. The decreasing trend of the young population (0-14) has been observed for both the rural and the urban areas (Table IV). In respect of working age group, though, rural area witnesses increasing trend whereas urban area shows the reverse trend. The proportion of old age population in rural area (>60) has been increased three times whereas urban area has reduced to some extent of this proportion.

Dependency Ratio of South 24 Parganas, 1991, 2001 and 2011:

Another measure of population structure is the dependency ratio that indicates the number of dependents per hundred workers and may be computed on the basis of three broad age groups. The population in the age group 15-59 is considered to be the working population; the age under 15 as the young dependents and above 60 is considered to be the old dependents. The dependency ratio is calculated by the following formula.

$$DependencyRatio = \frac{(\mathrm{P}\ 0-14+\mathrm{P}\ 60+)}{\mathrm{P}\ 15-49} \times \mathrm{k}$$

Where P 0-14, P 60+ and P 15-59 denotes the population in the age groups 0 to 14, above 60 and 15 to 59 respectively and where K is 100 (Bhende, 2004). The dependency ratio has witnessed a continuous diminishing trend i.e. 86.87 per cent (1991), 74.03 per cent (2001) and 58.00 per cent (2011) respectively. Due to the decrease of young (0-14 years age) population and increase of adult's population (15-59 age groups), the young dependency ratio has been consistently reduced (Table V, Figure 5) though, the old age dependency shows slightly upward trend in consecutive three Censuses.

Figure 4 Change of age sex composion by age groups of South 24 parganas, 1991-2001 and 2001-2011

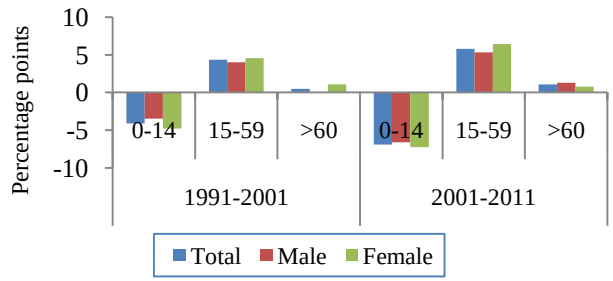
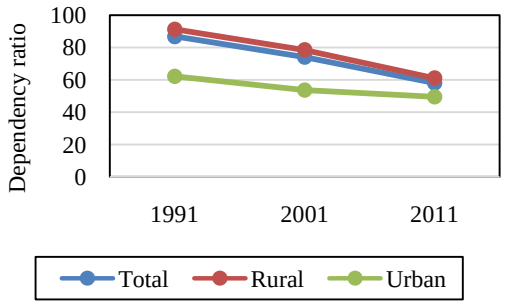


Figure 5 Trend of dependency ratio, 1991-2011



Source: District Census Hand Book: 1991, 2001 and 2011, South 24 Parganas; Primary Census Abstract, computed by the author.

Table V: Dependency ratio of south 24 Parganas: 1991, 2001 and 2011

Ratio	Dependency Ratio			Young Dependency Ratio			Old Dependency Ratio		
Year	1991	2001	2011	1991	2001	2011	1991	2001	2011
Total	86.87	74.03	58.00	74.98	62.20	45.55	11.89	11.83	12.45
Rural	91.32	78.57	61.12	79.21	66.77	48.89	12.11	11.80	12.23
Urban	62.18	53.67	49.50	51.53	41.58	36.50	10.65	12.09	13.00

Source: District Census Hand Book: 1991, 2001, and 2011; South 24 Parganas; Primary Census Abstract, computed by the author.

Except urban old dependency ratio, both rural young and old dependency ratio and only the urban young dependency ratio have witnessed declining trend.

VI. FINDINGS

- Remarkable declining trend has been observed in the age group of '0-14' shows consistent shrinking in the base of population pyramid for the decades.
- Higher percentage of female child in 0-14 year age group explains higher female fertility in rural area.
- Higher proportion of female old age population denotes greater life expectancy than male.
- More concentration of female in the reproductive age group in urban areas proves better medical care for female child than rural area.
- Urban area contribute relatively mature population pyramid than rural counterpart.
- Proportion of working population has been showing increasing trend in rural areas but urban area shows reverse picture of that for both gender.
- The young dependency ratio has been consistently reduced, though the old age dependency ratio shows slightly upward trend.

VII. CONCLUSION

The age sex composition has the dominant role for the population dynamics with special reference to fertility, mortality and migration. The female in the reproductive age group (15-49) actively participate in the process of fertility whereas the childhood age and old age are risky for the occurrence of mortality, though due to the blessings of medical science, the infant mortality has greatly decreased in recent years. The process of migration may occur in all ages due to different reasons. The broader base and narrower apex of the population pyramid signify a higher fertility in very young age cohort and relatively higher mortality in older age cohort. Such demographic scenario indicates the developing nature of the district's human development. The dependency ratio in both the rural and the urban areas have also shown declining trend which is a sign of demographic modernization.

REFERENCES

[1]. Bhende, A. and Kanitkar T., 2004, Principles of Population Studies, Himalaya Publishing House, Mumbai, pp. 158
[2]. Chandna, R.C, 2005, Geography of Population: Concepts, Determinants and Patterns, Kalyani Publishers, New Delhi, pp. 300
[3]. Clarke,John I., 1972, Population Geography, Pergamon Press, Oxford. pp. 66
[4]. Dhillon P. and Ladusingh L., 2013, "Working life gain from gain in old age life expectancy in India", Demographic Research, Volume 28, Article 26, 5th April, 2013, doi: 10.4054/DemRes.2013.28.26, pp. 734
[5]. Lutz Wolfgang, 2009, "The Demography of Future Global Population Aging: Indicators, Uncertainty and Educational Composition", Population and Development Review, Volume 35, Issue 2, 12th June 2009, pp. 1-6
[6]. Mukherjee Sudhansubhusan, 1976, The Age Distribution of the Indian Population : A reconstruction for the states and territories, 1881-1961, East-West Population Institute, University Press of Hawaii, Honolulu, Hawaii.
[7]. Pressat Roland, 1978, Statistical Demography, Methuen & Co Ltd, Cambridge, pp. 9
[8]. Schellenberg, J. R. M. A. and Berhanu D., 2020, "Major gaps in child survival by ethnic group", The Lancet, www.thelancet.com/lancetgh Volume 8, March 2020, pp. 1-2
[9]. Thomlinson R., 1965, Population Dynamics, New York: Random House, pp. 428
[10]. Trewartha, G.T., 1969, A geography of population: World patterns, John Wiley & Sons, New York. pp. 122
[11]. United Nations, 1967, Principles and Recommendations for the 1970 Population Censuses, Statistical Papers, Series M. No. 44, pp. 41

Dr. Jiban Krishna Mandal. "Transformation of Age Sex Composition of Population of South 24 Parganas District, West Bengal, India." *International Journal of Humanities and Social Science Invention (IJHSSI)*, vol. 09(3), 2020, pp 08-14.