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Dependency Ratio and Index of Aging

Abstract

The dependency ratio is an age-population ratio of those typically not in the labor force (the dependent part) and those typically in the labor force (the productive part). An attempt has been made to study the dependency ratio(s) and index of ageing among Khond, Gadaba and Savara tribes of Eastern Ghats of Andhra Pradesh, India. The comparative study shows that the child dependency ratios among the present study tribes register relatively higher value among Khond which is 55.52, while Gadaba record 42.61 and Savara report 45.65. However, the elderly dependency ratio exhibits the lowest value of 0.36 found among Savara followed by 0.71 among Khond and 2.23 among Gadaba. Further the total dependency ratio(s) of the present study tribes is low when compared with other tribes of Andhra Pradesh and India which indicates that the older tribal people are less dependent on working age population and remain eventual sufferers of poverty and disease.

Keywords: Dependency ratio, Khond, Gadaba, Savara, Tribes, Index of Aging

Introduction

Dependency ratio is expressed as the ratio of young and the elderly to those of prime working age group. The number and proportion of elderly population in India is increasing very fast. It is used to measure the pressure on productive population. The dependent part usually includes those under the age of 15 and over the age of 64. The dependency ratio can be categorized into the child dependency ratio and old-age dependency ratio. Child dependency ratio is the ratio of younger dependents i.e. people younger than 15 years of age group. Old age dependency ratio is defined as the number of persons older than 64 per 100 persons in the age-group 15-64 years. The productive part makes up population in between, ages 15-64 years. It is normally expressed as a percentage.

Population ageing is one of the structural changes in the population, a process that resulted due to demographic transition characterized with the decline of fertility and mortality (Zachariah, 2001; Rajan, Mishra and Sarma, 2000; Chaudhury, 2004; Preston, Himes and Eggers, 1989; Alam and Mukherjee, 2005; Gulati and Rajan, 1990; Gulati, 1989). At the population level, aging is simply a shift within different age groups in a society towards the older ones. At the individual level, it is about people living longer. The process of population ageing emerged recently in the less developed countries which is an ongoing process throughout the world (Rajan, Mishra and Sarma, 1999; Alam and Mukherjee, 2005; Alam and Agarwal, 1999; Gulati and Rajan, 1990; Sengupta and Agree, 2003; Alam, 2004). In comparison to the developed countries the India's population is still young. But in absolute terms India is the second highest elderly populated country after china (United Nations, 2003). China's population is aging more rapidly than India's, in the sense that the elderly are becoming an increasingly larger proportion of china's population due to declining fertility that reported near-replacement level by 1990 and to 1.7 by 2002. The decline was reinforced by strict birth planning policies enacted in the late 1970s and hence China will age sooner and more quickly than the less developed countries. At present in both China and India, the number of births considerably exceeds the number of deaths (Charles wolf et. al., 2011). In India, the proportion of people of working age who generate the income to pay for medical care will increase even as the number of elderly grows because of the drop in the number of children. This means the dependency ratio will decline or stay stable in less developed regions (Economist Intelligent unit, 2009). Adult children are the primary source of support and care for their older relatives. Older people today have children and many have grandchildren and living siblings. The global trend toward having fewer children assures that there will be less potential care and support for older people from their families in the future (Global health and aging, WHO, 2011). The World Health Organization



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(WHO) study on global ageing and adult health in six countries(SAGE) consisting of China, Ghana, India, Mexico, Russian Federation and South Africa.

One straightforward indicator of age structure is the aging index defined here as the number of people age 65 or older per 100 children under age 15. The current aging index usually is much lower in less developed countries than in the more developed world, and the pattern of future change is likely to vary among countries. Absolute change in the aging index will be small if future fertility rates remain in structure.

The present study is focused on dependency ratios of three primitive tribal groups of Andhra Pradesh, India in order to have an understanding of their socio-cultural and biological processes affecting the structure of the population. Khond, Gadaba and Savara are the tribal groups under study and differ from each other in various aspects. They differ in language, cultural pattern and socio-economic aspects etc., as majority of these tribes are living in the remote forest areas, remain isolated and they are largely unaffected by the developmental processes going on in the rest of the state.

Material and Methods

Demographic data was collected that would give an appropriate estimate to the population Characteristics. For selection of sample, to begin with, all villages where Khond, Gadaba and Savara are living were listed out with the help of statistics of Census 2001 and reports of the Integrated Tribal Development Agency (ITDA)s of Paderu, Parvathipuram, and Seethampeta of Visakhapatnam, Vizianagaram and Srikakulam districts respectively in order to set maximum response from the subjects and also considering the scattered and low frequency of tribal habitats, time and budget constraints.

From each of the selected village, households were selected randomly using purposive sampling method. Thus, the sample for Khond is 247 households drawn from 36 villages, the sample for Gadaba is 269 households drawn from 32 villages and similarly the sample for Savara is 167 households collected from 36 villages. The households with at least one married women were selected from the respective tribal populations and the information about elderly people covered in each household were properly considered. Data was analyzed using Excel spread sheets. Data collected through interview schedule were edited and coded using a code design prepared exclusively for this purpose. Besides using computer, hand tabulation was also done wherever necessary. Different formulae used in the calculation of Dependency Ratios and Index of Aging are as follows:

1. **Index of Aging:** It is the ratio of 'population of 65 years and older' to 'population under 15 years'.

$$\text{Index of Aging} = \frac{P_{65+}}{P_{0-14}} \times 100$$

2. **Child dependency ratio:** It is the ratio of 'population under 15 years' to 'population of 15 to 64 years'.

$$\text{Child dependency ratio} = \frac{P_{0-14}}{P_{15-64}} \times 100$$

3. **Elderly dependency ratio:** It is the ratio of 'population 65 years and older' to 'population 15 to 64 years'.

$$\text{Elderly dependency ratio} = \frac{P_{65+}}{P_{15-64}} \times 100$$

4. **Age (Total) dependency ratio:** Ratio of persons in the 'dependent ages' (under 15 years and over 65 years) to those in the 'economically productive' ages (15-64 years). The formulae used for calculation of Dependency ratio(s) were adopted from Mosley (2006).

$$\text{Age (Total) dependency Ratio} = \frac{P_{0-14} + P_{65+}}{P_{15-64}} \times 100$$

Results and Discussion

Index of Aging is an important indicator of age structure which measures the longevity defined as the percentage of aged population to child population. If the index of aging is 100, the ratio of youth to elderly is even. In the developed and developing countries, the ratio is more than 100 due to higher proportion of elderly people. As per norms, if the index is below 15 percent the population is categorized as underdeveloped (Gavrilov and Heuveline, 2003). If 65+ years is considered as elderly people, the proportion of these people among tribes will be very small due to lower longevity and life expectancy. As such the index of aging among tribes in India will be usually low. Among the present study tribes the index of aging is 0.79 among Savara, 1.27 among Khond and 5.25 among Gadaba which are very low. All the present study tribes with less than 15% of Index of aging value fall in underdeveloped category.

The dependency ratio is the percentage of the combined population aged less than 15 years and aged 65 years and above, divided by the population aged 15–64 years (Barclay, 1958). However several authors as well as Census of India (2001, 2011) have considered above 60 years as elderly dependents and as such dependency ratios reported by those studies may be slightly higher. The dependency ratio (derived from the age composition of a population) is based on the fact that every member of a society is a consumer and only some members are producers (Thompson and Lewis, 1965). The dependency ratio also reflects the level of development of a region. The dependency ratio, which is the ratio of economically active to inactive persons, is dependent on age composition. India has one of the largest proportions of population in the younger age groups in the world with 35.3% of the population of the country in the age group 0-14 years and 41% of the population account for less than 18 years of age as per the Census of India, 2001.

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The dependency ratios among the present study tribes are listed in Table-1. The child dependency ratio indicates percentage of dependent child population (0-14 years) to the working population (15-64 years). The child dependency ratio among the present study tribes registers relatively higher value among Khond which is 55.52, while Gadaba record 42.61 and Savara reported 45.65 percent. Rao (1985) observed slightly lower child dependency ratio among Savara (42.2) and Jatapu (36.91), while Jaikishan (1991) reported a ratio of 40.69 among KondaKammara tribe. The populations of Andhra Pradesh record an intermediary value of 36.94, while populations of India register a child dependency ratio of 51.0 (Census of India, 2011). The child dependency ratio of present study tribes is lower than many tribes of (listed in Table 2) North India, Central India and North East India (Chachra and Bhasin, 1998; Bhasin and Nag, 2002; Pandey and Tiwari, 2000; Maheo, 1999). Further, the tribes of Andhra Pradesh listed in Table 1 namely Chenchu I (90.09) Sugali (82.67) and Chenchu II (70.37) have recorded higher child dependency ratios.

Similarly the elderly dependency ratio which indicates the percentage of old people to the working population exhibit very low ratios among the present study tribes with the lowest value of 0.36 found among Savara followed by 0.71 among Khond and 2.23 among Gadaba. Rao (1985) also found lower elderly dependency ratios among Savara (0.27) and Jatapu tribes (0.37). These ratios are lower when compared with Kolam (5.59) and Thoti (3.28: Sachdeva et al., 2004), Chenchu I (4.89: Sirajuddin, 1991), Sugali (3.15: Reddy and Reddy, 1991) tribes of Andhra Pradesh as well as general population of Andhra Pradesh (13.21) and India (14.2) as per Census of India (2011). Majority of tribes from Northern, Eastern and Central regions of India (BhasinandNag, 2002; PandeyandTiwari, 2000) have recorded higher elderly dependency ratio than present study populations.

The child dependency ratio and elderly dependency ratio were combined to provide the percentage of dependent population on the working population referred to as age dependency ratio, also termed as total dependency ratio. Relatively higher age dependency ratio(s) is observed among Khond (56.23) and then monitored among Gadaba (44.84) and Savara (46.01) indicating slightly higher burden for working force of Khond tribe. Similar to the present study tribes, Rao (1985) also observed lower total dependency ratio among Savara (42.47) and Jatapu (37.28) tribes. The present study tribes exhibit lower total dependency ratio(s) than Chenchu I tribe (94.99) reported by Sirajuddin (1991) and general population of Andhra Pradesh (50.15) and India (65.2) as registered in Census of India (2011) but record slightly higher value than Thoti tribe (44.21) from Andhra Pradesh (Sachdeva et al., 2004). Further the total dependency ratio is very low among the present study tribal populations when compared with other tribal populations of Northern, Eastern and Central regions of India (Chachra and Bhasin, 1998; Bhasin and Nag,

2002; Pandey and Goel, 1999; Bhasin and Bhasin, 1995; Sabat and Dash, 1996).

Conclusion

Reduction in dependency ratio indicates a phase of population transition where higher proportion of persons in the working age group may translate into higher per capita income for the economy. This is also called the phase where a population group is benefited from 'Demographic Dividend'. The studies show that socio-economic condition of older people is more vulnerable due to poverty regardless of their original economic status, physical weakness, family reluctance, powerlessness. Early age at marriage and early conception, high fertility within short intervals and relatively high mortality rates especially prenatal and post natal deaths, affects the health of the women during old age. Similarly the tribal men are meticulous workers throughout their life and work in coordinating the economy of the families. The present study tribes show early signs of old age before the onset of 65 years resulting in bodily changes. The drastic physical changes further aggravate the situation during oldage. All the present study tribes show less than 15% of Index of aging value fall in underdeveloped category characterized by high child dependency ratio and low elderly, and low total dependency ratio(s).

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Table 1: Index of Aging and Dependency Ratio among present study tribes along with the populations of Andhra Pradesh

Tribe	N	0-14 years		15-64 years		65+ years		Index of Aging (%)	Dependency ratio			
		N	%	N	%	N	%		Child (%)	Elderly (%)	Total (Age) (%)	
											(0-14)+ 65+	
Khond	1103	392	35.54	706	64.01	5	0.45	1.27	55.52	0.71	56.23	Present study
Gadaba	1166	343	29.42	805	69.04	18	1.54	5.25	42.61	2.23	44.84	Present study
Savara	806	252	31.26	552	68.49	2	0.25	0.79	45.65	0.36	46.01	Present study
Savara II	1112	468	42.08	1109	99.73	3	0.26	0.64	42.20	0.27	42.47	Rao, 1985
Jatapu	1066	392	36.77	1062	99.62	4	0.37	1.02	36.91	0.37	37.28	Rao, 1985
KondaKammara	403	164	40.69	403	0	0	0	0	40.69	0	40.69	JaiKishan, 1991
Sugali	1416	630	44.49	762	53.81	24	1.69	3.81	82.67	3.15	85.82	Reddy and Reddy,

												1991
Chenchu I	1831	846	46.20	939	51.28	46	5.43	5.43	90.09	4.89	94.99	Sirajuddin, 1991
Chenchu II	834	342	41.01	486	58.27	6	0.72	1.75	70.37	1.23	71.60	Sirajuddin, 1991
Kolam	-	-	-	-	-	-	-	-	-	5.59	-	Sachdeva et.al, 2004
Thoti	-	-	-	-	-	-	-	-	-	3.28	44.21	Sachdeva et.al, 2004
Andhra Pradesh*	-	-	32.01	-	60.21	-	7.59	2.37	53.17	12.61	65.78	Census of India, 2001
Andhra Praesh**	-	-	24.6	-	66.6	-	8.8	3.57	36.94	13.21	50.15	Census of India, 2011
India*	\-	\-	34.30	\-	59.50	\-	6.2	1.35	50.94	12.59	63.53	Census of India, 2001
India**	-	-	29.5	-	62.5	-	8.0	2.71	51.0	14.2	65.2	Census of India, 2011

*Census of India (2001), Registrar General of India, has considered 0-14 years as Children, 15-59 as Working group, 60+ years as Elderly people and calculated Dependency ratio (s).

** Census of India (2011), Registrar General of India, has considered 0-14 years as Children, 15-59 as Working group, 60+ years as Elderly people and calculated Dependency ratio (s).

Table 2: Dependency Ratio(s) among present study tribes along with the populations of India

Tribe	Dependency ratio			Reference
	Child / Young Age Dependency ratio (%)	Elderly/ Old Age Dependency ratio (%)	Total Age Dependency Ratio (%)	
Khond	55.52	0.71	56.23	Present Study
Gadaba	42.61	2.23	44.84	Present Study
Savara	45.65	0.36	46.01	Present Study
Raji	73.71	6.29	80	Patra, 2010
Bharia and Kamar	75	-	-	Pandey and Tiwari, 2000
Hill Korawa	54.0	-	-	Pandey and Tiwari, 2000
Kamar	-	6.8	-	Pandey and Tiwari, 2000
Birhor	-	11.9	-	Pandey and Tiwari, 2000
Bhotia	80	-	-	Bhasin and Nag, 2002
Bodh	63.09	9.69	72.78	Bhasin and Nag, 2002
Brokpas	73.04	7.35	80.39	Bhasin and Nag, 2002
Arghuns	50.09	-	55.92	Bhasin and Nag, 2002
Baltis	-	5.54	85.63	Bhasin and Nag, 2002
Abujhmaria	86.9	7.1	93.0	Pandey and Goel, 1999
Mao	64.52	8.82	73.34	Maheo, 1999
MarchaBhotia	49.01	-	53.75	Chachra and Bhasin, 1998
JuharBhotia	56	4.02	60.55	Chachra and Bhasin, 1998
DharchulaBhotia	53	3.88	83.88	Chachra and Bhasin, 1998
Kondh	53.31	8.01	61.62	Sabat and Dash, 1996
Tamangs	66.43	5.59	72.02	Bhasin and Bhasin, 1995
Sherpas	78.95	-	78.95	Bhasin and Bhasin, 1995
Bhutia	81.94	6.27	88.21	Bhasin and Bhasin, 1995
Lepchas	77.84	3.79	81.63	Bhasin and Bhasin, 1995
Gaddis	75.18	5.98	81.16	Bhasin and Bhasin, 1993
Jaunsari	-	-	79.09	Chauhan et al.,1991
Bhotia	-	-	81.98	Chauhan et al.,1991
Buksa	-	-	95.52	Chauhan et al.,1991