

Population Growth and its Impact on Agriculture in India: A Geographical Perspective

Dr. Sneh Sangwan¹, Dr. Balwan Singh², Ms. Mahima³

¹Associate Professor, Department of Geography, BPS Institute of Higher Learning, Khanpur Kalan, Sonipat, Haryana, India

²Associate Professor, Department of Geography, Govt. College, Karnal, Haryana, India

³Assistant Professor, Department of Geography, A.I. Jat H.M. (P.G.) College, Rohtak, Haryana, India

ABSTRACT

The present study has described that India occupies 2.4 per cent of the world's land area and supports over 17.5 per cent of the world's population. India has more arable land area than any country except the United States, and more water area than any country except Canada and the United States. Indian life, therefore, revolves mostly around agriculture and allied activities in small villages, where the overwhelming majority of the population live.

Keywords : Population Growth, Agriculture, Arable Land, Water Area, Allied Activities, Land Holding.

I. INTRODUCTION

As per the 2001 census, 72.2 per cent of the population lives in more than 64 thousand villages and the remaining 31.2 per cent lives in 7933 towns consisting of 53 million plus cities as per 2011 census.

In 1901, the world population was 1.6 billion. By 1960, it became 3 billion, and by 1987, 5 billion and in 1999, 6 billion. Currently, one billion people are added every 12 – 13 years. When we see the population growth in India as shown in the table below, it will be observed that while the population of the country was 27.13 crore in the year 1900, it decreased to 26.31 crore in 1925 and increased to 35.04 crore in 1950 and 36.23 in 1951. From here onwards, the population growth took exponential proportions of growth to 43.88 crore in 1961, 54.79 crore in 1971, 68.52 crore in 1981, 84.39 crore in 1991, 102.70 crore in 2001 and 181.95 crore in 2011.

II. OBJECTIVE OF THE STUDY

The basic objective of the present study is to analyze the impact of population growth on agriculture

III. DATA SOURCES AND METHODOLOGY

In the present study, we estimate the following equation to decompose the change in the agriculture in terms of mean effect, inequality effect and the effect due to population growth in two sub-periods 1995-96 and 2000-2001. Data are collected from various secondary sources. An average and percentage method is used to analyze the Data.

IV. POPULATION GROWTH IN INDIA

With over 1210 million people, India is currently the world's second largest populated country. India crossed one billion mark in the year 2000, one year after the world's population crossed the six billion threshold. It is expected that India's population will

surpass the population of China by 2030 when it would have more than 153 crore of population while China would be number two with a population of 146 crore.

Since 1947, the population has more than tripled which has resulted in increasingly impoverished and sub-standard conditions in growing segments of the Indian population.

In 2007, India ranked 126th on the United Nation's Human Development Index, which takes into account social, health, and educational conditions in a country.

However, as per Human Development Report (HDR) -2016, India with HDI value of 0.624 achieved 131 rank, out of 188 countries of the world.

Although we are second to China in population, our country is adding almost an entire Australia each year, while literacy and girl child awareness are growing only at a slow rate, illiteracy, unemployment, poverty are increasing in leaps and bounds.

Though, the government has taken steps to curb the population boom, but its effects will be visible only a few years down the line as and when the rules percolate to the rural regions of India, where **more hands mean more income** is the nature of thought everyone pursues. Notwithstanding that it affects the entire country and only leads to increase in poverty in that home and every home that thinks the same especially in the rural India.

Demographic data-INDIA

population	year	population	year	population	year	population	year
271306,0	1900	277175,0	1930	431463,0	1960	833929,0	1990
270183,0	1901	279115,0	1931	438800,0	c1961	843931,0	1991c
269064,0	1902	284102,0	1932	452378,0	1962	883473,0	1992
267950,0	1903	287902,0	1933	462196,0	1963	900453,0	1993
266840,0	1904	291753,0	1934	472305,0	1964	918570,0	1994
265735,0	1905	295666,0	1935	482706,0	1965	934228,0	e1995
264635,0	1906	299614,0	1936	493389,0	1966	945121,0	1996
263539,0	1907	303626,0	1937	504345,0	1967	962378,0	1997
262447,0	1908	307694,0	1938	515601,0	1968	979673,0	1998
261361,0	1909	311820,0	1939	527177,0	1969	997515,0	1999
260278,0	1910	316004,0	1940	539075,0	1970	1014003,8	e2000m
259201,0	1911	318826,0	1941	547900,0	c1971	1027015,2	c2001
258127,0	1912	324180,0	1942	563530,0	1972		2002
257058,0	1913	328255,0	1943	575887,0	1973		2003
255994,0	1914	332332,0	1944	588299,0	1974		2004
254934,0	1915	336562,0	1945	600763,0	1975	1094985,0	2005e
253878,0	1916	340796,0	1946	613273,0	1976		2006
252827,0	1917	345085,0	1947	630200,0	1977m		2007
251780,0	1918	349430,0	1948	644330,0	1978m		2008
250737,0	1919	353832,0	1949	658730,0	1979m		2009
249699,0	1920	350445,0	1950	688956,0	1980	1170014,0	2010e
251441,0	1921	363211,0	1951	685200,0	c1981		2011
254963,0	1922	369231,0	1952	703570,0	1982m		2012
257637,0	1923	375633,0	1953	719090,0	1983m		2013
260339,0	1924	382438,0	1954	734870,0	1984m		2014
263071,0	1925	395096,0	1955	749184,0	1985	1237985,0	2015e
265831,0	1926	397334,0	1956	767200,0	1986m	1304263,0	2020ep
268621,0	1927	405450,0	1957	783730,0	1987m	1370028,0	2025ep
271442,0	1928	414021,0	1958	797526,0	1988	1432181,0	2030ep
274293,0	1929	423053,0	1959	817490,0	1989m	1706951,0	2050ep

Overpopulation does not depend only on the size or density of the population, but on the ratio of population to available sustainable resources. It also depends on the way resources are used and distributed amongst the population. If a given

environment has a population of 10 individuals, but there is food or drinking water enough for only 9, then in a closed system where no trade is possible, that environment is overpopulated; if the population is 100 but there is enough food, shelter, and water for

200 for the indefinite future, then it is not overpopulated. Over population can result from an increase in births, a decline in mortality rates due to medical advances, from an increase in immigration, or from an unsustainable biome and depletion of resources.

Note that nothing has been done in India about the population control. After India became independent, population growth was seen as a major impediment to the socio-economic development of the country and restricting the population growth was seen as an appropriate development process related to economic development. At the same time, it was felt that small family would benefit both the individual family, the Nation as such as well as the women's health. In 1952, a sub-committee appointed by the Planning Commission asked the government to provide sterilization facilities and contraceptive advice through existing health services, in order to limit family size.

The family planning and population control measures were instituted abundantly and effectively till 1980's but after that (Sanjay Gandhi and Bansi lal episode) the whole political, bureaucratic, social and voluntary set ups in the country seem to have shut their eyes towards this issue and virtually closed this chapter once for all. The population of the country is increasing by leaps and bounds without anybody's botheration. Gone are the slogans of 70s and 80s that HUM DO HAMARE DO and the PAHLA BACHA ABHI NAHI, DO KE BAD KABHI NAHIN and where do we see the RED TRIANGLE on the walls in the country today.

Worst sufferers are the poor, as they, not only increase larger in number due to ignorance but their economic status further gets deteriorated. The government need to put in place an effective population control system with an aim to formulate a policy that every family living in the country to limit their family size to 3-4 irrespective of the caste, creed, religion, community or region. The unwieldy growth

of population has affected the living conditions of the people. The time has come when future citizens while in educational institutions should understand issues related to the population explosion and the consequential problems.

The centralization of whatever little family planning programs the country has, is often preventive due to stark considerations being given to regional differences. Centralization is, to a large extent, due to sole reliance on central government's funding. As a result, many of the goals and assumptions of national population control programs do not correspond exactly with local psyche and attitudes toward birth control. In large part of India, people have strong preference for sons which leads to avoidable population growth. They have a feeling that more sons will assist them as farm labour and security in old age but it is hardly true.

An important family planning program in India is the Project for Community Action in Family Planning. Located in Karnataka, the project operates in 154 project villages and 255 control villages. All project villages are of sufficient size to have a health sub centre, although this advantage is offset by the fact that those villages are the most distant from the area's primary health centers. The project is much assisted by local voluntary groups, such as the women's clubs. The local voluntary groups either provide or secure sites suitable as distribution depots for condoms and birth control pills and also make arrangements for the operation in sterilization camps. Data provided by the Project for Community Action in Family Planning show that important achievements have been realized in the field of population control.

India is facing intense problem of population outburst. People are experiencing the crisis such as climate change, shortage of food and also severe energy crisis. Our civilization is being squeezed between rising population densities. It can be said that if such trends continue, there will be a severe shortage of food supply not at a very distant future.

While in certain places, there is shortage of drinking water, there are areas which suffer due to devastating floods every year. Village people have started migrating to cities where they have hopes to get some water and employment. Today a beginning seems to have been evident of fights for food, water and place to live. The importance of this National issue needs to be understood by one and all as soon as possible. A very strong, determined and effective steps need to be initiated and instituted by the people themselves, the Government, Voluntary agencies/NGOs, Religious Heads, Educational Institutions, Corporate and other Social Organizations. Sooner the better. People should on their own restrain themselves to produce more children voluntarily to sustain a better quality of life not only for themselves but also for their children and the Nation and the future generations. Otherwise the future generations are quite likely to curse their forefathers for leaving an unmanageable legacy of huge population who has to struggle everyday to live their life peacefully and comfortably.

V. POPULATION AND SIZE OF LAND HOLDINGS

India has become a land of small farms, of peasants cultivating their ancestral lands mainly by family labor and, despite the spread of tractors in the 1980s, by pairs of bullocks. About 50 per cent of all operational holdings in 1980 were less than one hectare in size which had increased to 62.3 per cent in 2000-01. About 19 per cent fell in the one-to-two hectare range, 16 per cent in the two-to-four hectare range which reduced to 11.8 per cent in 2000-01, and 11 per cent in the four-to-ten hectare range which had also reduced to 5.5 per cent in 2000-01. Only 4 per cent of the working farms encompassed ten or more hectares in 1980 but this had also reduced to barely 1 per cent in the year 2000-01. This amply speaks of the dwindling size of the landholdings in India as can be seen from Table-1 below.

Table-1

Distribution of Operational Holdings - All India

Category of Holdings	No. of Operational Holdings		Area Operated		Average Size of Operational Holdings	
	No. of Holdings: ('000 Number)		Area Operated: ('000 Hectares)		Average size: (Hectares)	
	1995-96	2000-01*	1995-96	2000-01*	1995-96	2000-01*
1	2	3	4	5	6	7
Marginal (Less than 1 hectare)	71179 (61.6)	75408 (62.3)	28121 (17.2)	29814 (18.7)	0.40	0.40
Small (1.0 to 2.0 hectares)	21643 (18.7)	22695 (19.0)	30722 (18.8)	32139 (20.2)	1.42	1.42
Semi-Medium (2.0 to 4.0 hectares)	14261 (12.3)	14021 (11.8)	38953 (23.8)	38193 (24.0)	2.73	2.72
Medium (4.0 to 10.0 hectares)	7092 (6.1)	6577 (5.5)	41398 (25.3)	38217 (24.0)	5.84	5.81
Large (10.0 hectares and above)	1404 (1.2)	1230 (1.0)	24163 (14.8)	21072 (13.2)	17.21	17.12
All Holdings	115580 (100.0)	119231 (100.0)	163357 (100.0)	159436 (100.0)	1.41	1.33

Source : Agricultural Census Division, Ministry of Agriculture, New Delhi.

It has been observed from Table 1 above that while overall no. of agriculture holdings in India increased from 115.58 million in 1995-96 to 119.23 million in 2000-01. The increase was sharper in the categories of marginal holdings (less than 1 hectare) which was from 71.18 million to 75.41 million) and small holdings (1 to 2 hectare) which was 21.64 million to 22.69 million). In fact, there was also a substantial decline in the no. of holdings in the case of semi-medium sized holdings (above 2 hectare) which decreased from 22.76 million to 21.83 million). It implies that gradually the no. of small holdings is on the increase in the country due to rising population and the consequent division of the landholdings.

It has been revealed from Table 2 that the all India average size of the landholding has also reduced from 1.41 ha. to 1.33 ha. between 1995-96 to 2000-01 and by all probabilities the average size landholding

presently would be nearly 1.25 ha. It has also been observed that 62 per cent of the total landholdings are marginal holdings below 1 ha with average size being .40 ha i.e. 1 acre per family in the year 2000-01. One can imagine the situation prevailing now, after 10 years of the last census, which would have gone still smaller with the trend set-in in the past.

Although farms in India are typically small throughout the country, the average size of land holdings by state ranges from about 0.5 hectare in Kerala and 0.75 hectare in Tamil Nadu to three hectares in Maharashtra, 3.65 hectares in Rajasthan, 4.03 ha. in Punjab and highest of 7.28 ha. in Nagaland as shown in the Table 2. Factors influencing this range include soils, topography, rainfall, rural population density, and thoroughness of land redistribution programs in India.

Table-2
State-wise Average Size of Operational Holdings
by Major Size Groups, 2000-01*

State/UT	(Hectares)					
	Marginal	Small	Semi-Medium	Medium	Large	All Holdings
1	2	3	4	5	6	7
Andhra Pradesh	0.44	1.42	2.67	5.70	16.34	1.25
Arunachal Pradesh	0.50	1.32	2.66	5.77	16.13	3.69
Assam	0.39	1.30	2.73	5.22	53.02	1.15
Bihar	0.30	1.21	2.62	5.24	15.50	0.58
Chhattisgarh	0.44	1.42	2.70	5.76	16.49	1.60
Goa	0.32	1.26	2.56	5.64	23.77	0.84
Gujarat	0.53	1.46	2.78	5.80	16.91	2.33
Haryana	0.45	1.43	2.81	5.99	16.48	2.32
Himachal Pradesh	0.41	1.40	2.71	5.69	15.91	1.07
Jammu & Kashmir	0.37	1.40	2.66	5.39	21.13	0.67
Karnataka	0.46	1.44	2.72	5.83	14.83	1.74
Kerala	0.14	1.32	2.52	5.29	40.93	0.24
Madhya Pradesh	0.49	1.45	2.77	5.94	15.50	2.22
Maharashtra	0.50	1.42	2.69	5.64	15.38	1.66
Manipur	0.53	1.29	2.47	4.86	11.38	1.15
Meghalaya	0.55	1.45	2.58	5.41	13.12	1.30
Mizoram	0.64	1.28	2.33	4.78	13.14	1.24
Nagaland	0.52	1.19	2.55	6.20	15.83	7.28
Orissa	0.50	1.39	2.69	5.63	16.48	1.25
Punjab	0.63	1.40	2.67	5.75	15.14	4.03
Rajasthan	0.48	1.44	2.85	6.19	18.21	3.65
Sikkim	0.42	1.40	2.74	5.79	20.67	1.57
Tamil Nadu	0.37	1.40	2.72	5.68	19.48	0.89
Tripura	0.31	1.37	2.55	5.16	78.77	0.56
Uttarakhand	0.39	1.39	2.71	5.47	25.07	0.95
Uttar Pradesh	0.40	1.41	2.74	5.57	15.07	0.83
West Bengal	0.51	1.59	2.77	5.12	278.95	0.82
A & N Islands	0.39	1.38	2.53	4.31	46.79	2.00
Chandigarh	0.39	1.42	2.79	5.92	12.00	1.44
Dadar & Nagar Haveli	0.52	1.32	2.75	5.78	15.95	1.48
Daman & Diu	0.29	1.37	2.63	5.86	20.25	0.59
Delhi	0.42	1.38	2.86	5.77	15.27	1.52
Lakshadweep	0.19	1.27	2.56	5.47	22.33	0.27
Pondicherry	0.29	1.42	2.74	5.68	19.50	0.70
All-India*	0.24	1.42	2.39	4.42	13.16	1.33

Source: Agricultural Census Division, Ministry of Agriculture, New Delhi.

Analysis of data at the household level in Khabra Kalan village in the Thar desert of India revealed that the land holding size is halved every 20–30 years due to subdivision of land holdings. The subdivision is caused by the equal sharing among sons at the time of inheritance based on the succession laws, and attributed to the increase in the village population. The shrinking land holdings resulted in a shortfall of food on small farms; 12 per cent in cereals and 42 per cent in pulses, promoted continuous cultivation and the increase of monoculture, and deteriorated the land productivity through its effect on the soil fertility and land management.

When the state-wise position is reviewed as per the details given in Table 3, it is observed that out of the total land holdings of 11.99 crores in the country 2.17crore (more than 18%) holdings are only in the state of Uttar Pradesh followed by 1.21 crore in Maharashtra, 1.16 crore in Bihar, 1.15 crore in Andhra Pradesh, 73.6 lakh in M.P., 70.8 lakh in Karnataka, 67.9 lakh in West Bengal, 66.6 lakh in Kerala, whereas in Haryana the no. of land holdings was 15.28 lakh and 9.97 lakh in Punjab. The percentage of marginal farmers i.e. land holding size less than 1 ha. was highest at 95.2% in Kerala

followed by Bihar at 84.1%, J&K at 81.4%, West Bengal at 80.4%, U.P. at 76.9%, Tamil Nadu at 74.4%, while on the other hand Haryana had 46.1% of marginal holdings, Maharashtra 43.7%, Gujarat 30.6% and Punjab was the lowest at 12.3% among the major States in India.

It would be interesting to observe that the proportion of semi medium to medium holdings is the highest at 629000 (63 %) out of the total holdings of 997000 in Punjab, whereas in the whole country, the same is 17.2 % and in Kerala it is 1.3%, in West Bengal 4.6%, in Bihar 6.5% , in UP the same is 8.9. % and 9.7 % in Tamil Nadu. Even in Haryana and Rajasthan, the proportion of semi medium to medium farmers is 31% and 39% respectively. This speaks of the comparative affluency of farmers in Punjab and Haryana with reasonably big size of the farms as well as the productivity levels which is high, of course, due to the availability of the irrigation at virtually no cost, adoption and availability of H.Y.V seeds and fertilizers, etc. and of course the passion for farming of the hard working farmers in the region.

Table-3

State-wise Number of Operational Holdings by Major Size-Groups, 2000-01*

State/UT	('000 Number)					All Holdings
	Marginal	Small	Semi-Medium	Medium	Large	
1	2	3	4	5	6	7
Andhra Pradesh	7023	2518	1424	501	66	11532
Arunachal Pradesh	13	20	36	30	6	107
Assam	1699	561	352	96	3	2712
Bihar	9743	1069	589	164	9	11574
Chhattisgarh	1747	716	508	245	39	3255
Goa	52	7	3	1	1	64
Gujarat	1298	1257	1043	576	65	4239
Haryana	704	294	278	202	50	1528
Himachal Pradesh	615	174	90	31	4	914
Jammu & Kashmir	1175	179	76	13	1	1443
Jharkhand##	0	0	0	0	0	0
Karnataka	3252	1909	1259	569	89	7079
Kerala	6335	227	76	16	3	6657
Madhya Pradesh	2838	1951	1488	917	166	7360
Maharashtra	5306	3606	2274	865	87	12138
Manipur	75	49	22	3	0	149
Meghalaya	115	57	35	7	0	214
Mizoram	34	28	13	1	0	76
Nagaland	5	9	28	68	34	144
Orissa	2295	1114	501	145	13	4067
Punjab	123	173	328	301	72	997
Rajasthan	1849	1210	1200	1100	460	5819
Sikkim	36	15	10	3	1	67
Tamil Nadu	5846	1226	571	193	23	7859
Tripura	406	55	17	2	0	479
Uttarakhand	628	158	78	24	1	891
Uttar Pradesh	16659	3087	1427	463	32	21668
West Bengal	5462	1009	283	35	1	6790
A & N Islands	4	3	3	2	0	11
Chandigarh	1	0	0	0	0	1
Dadar & Nagar Haveli	7	4	2	1	0	14
Daman & Diu	5	1	0	0	0	6
Delhi	16	6	4	2	0	28
Lakshadweep	10	0	0	0	0	10
Pondicherry	31	4	2	1	0	38
Total	75409	22696	14020	6577	1228	119930

Source: Agricultural Census Division, Ministry of Agriculture, New Delhi.

VI. AGRICULTURE SCENARIO IN INDIA

Over seventy per cent of India's population still lives in rural areas. There are substantial differences between the states in the proportion of rural and urban population (varying from almost 90 per cent in Assam and Bihar to 61 per cent in Maharashtra). Agriculture is the largest and one of the most important sectors of the rural economy and contributes both to economic growth and employment. Its contribution to the Gross Domestic Product has declined over the last five decades from 42 per cent to 18 per cent but agriculture still remains the source of livelihood for nearly 70 per cent of the country's population. A large proportion of the rural work force is poor and consists of marginal farmers and landless agricultural labourers. There is substantial unemployment and under employment among these people; both wages and productivity are low. These, in turn, result in poverty; it is estimated that 380 million people are still living below the poverty line in rural India.

Even in the field of Agro Processing, there has been no appreciable progress. Though, it has perhaps been thought that the farmers would be involved in the setting up of agro processing activities but looking at their average land holding size and the level of availability of resources with the individual farmers, it is doubtful whether a farmer can venture into this highly capital intensive and risky agro processing sector. The answer lies in the strength of unity and collective venturism which though seems quite difficult but not impossible provided the leaders show enthusiasm, cooperation, professionalism, technology savvy and above all the transparency.

The existing industry has been facing problems of low capacity utilization, technological obsolescence and marketing. It has to work under the constraints of high fluctuations in raw material availability & quality, fluctuating market price, poor technology for handling and storage, inadequate R&D support for product development, high cost of energy

and uncertainty in availability of adequate quantity for processing purposes, inadequate and expensive cold chain facilities and varying requirement of processing conditions from one material to another.

VII. CONCLUSION AND SUGGESTION

1. It can be summarized that the growing population in India has a negative impact on the agriculture development in India, because India is a land of villages where about 70 per cent of the total population is residing.
2. There are wide regional variations in the size of land holdings. The percentage of marginal farmers i.e. land holding size less than 1 ha. was highest at 95.2% in Kerala followed by Bihar at 84.1%, J&K at 81.4%, West Bengal at 80.4%, U.P. at 76.9%, Tamil Nadu at 74.4%, while on the other hand Haryana had 46.1% of marginal holdings, Maharashtra 43.7%, Gujarat 30.6% and Punjab was the lowest at 12.3% among the major states of India.
3. Because of over-population, the size of land holdings is on a continuous decrease in India which is not suitable for mechanized farming as it requires large size of land holdings.
4. Emphasis should be put on the establishment of new agro-industrial plants in the production catchments to minimize transport cost, make use of lower cost land and more abundant water supply, create employment opportunity in the rural sector and utilize/process waste and by-products for feed, irrigation and manure.
5. Infrastructure in the production catchments selected for agro-industrial development should be improved. Because of uncertain grid power supply to rural areas, decentralized power generation using locally available resources may become an integral part of agro-industrial development. Similarly, if the raw materials and processed products are perishable or semi-perishable in nature, cold chain technology will have to be established in the area.

6. The national plan should provide for management of agro-industrial activities in the catchment area, both by private companies and individuals as well as cooperatives.
7. Financial incentives and support should be provided on liberal scale to promote the modernization of agro-processing industry and for establishing new such industries in production catchments.
8. Arrangements to supply market information to the farmer and agro-processor should be put in place.

VIII. REFERENCES

- [1]. Agricultural Census Division, Ministry of Agriculture, New Delhi.
- [2]. R. P. Kachru, Asstt. Director General (Process Engineering), "Agro-Processing Industries in India—Growth, Status and Prospects", Indian Council of Agricultural Research, New Delhi.
- [3]. <http://www.thehindubusinessline.com/economy/%E2%80%98Agriculture-dependent-population-in-India-grew-by-50-during-1980-2011%E2%80%99%E2%80%99/article20732367.ece>
- [4]. http://www.business-standard.com/content/b2b-chemicals/future-of-agriculture-in-india-is-the-nation-ready-116053000558_1.html
- [5]. DR. D.G. SATIHAL , DR. L.D. VAIKUNTHE AND DR P. K. BHARGAVA (2007). IMPACT OF POPULATION GROWTH ON AGRICULTURAL LAND UTILIZATION IN KARNATAKA, INDIA. <http://uaps2007.princeton.edu/papers/70762>