Global Depopulation and Redistribution by 2050 A.D.

Global Depopulation and Redistribution by 2050 A.D.

By

Prithvish Nag and Amrita Paul

Cambridge
Scholars
Publishing

Global Depopulation and Redistribution by 2050 A.D.

By Prithvish Nag and Amrita Paul

This book first published 2024

Cambridge Scholars Publishing

Lady Stephenson Library, Newcastle upon Tyne, NE6 2PA, UK

British Library Cataloguing in Publication Data
A catalogue record for this book is available from the British Library

ISBN (10): 1-0364-0218-5
ISBN (13): 978-1-0364-0218-1

Dedicated to

IGU Commission on Population Geography Conference, Calcutta (Kolkata), 1985. (LHS: Dr P. Nag; RHS: Prof. J. I. Clarke)

Professor John Innes Clarke, OBE
Former Pro-Vice-Chancellor of the University of Durham
and
Chairman, International Geographical Union
Commission on Population Geography
(1980–88)

CONTENTS

LIST OF FIGURES

LIST OF TABLES

Appendices

About the Authors

Dr Prithvish Nag was the vice-chancellor of the Mahatma Gandhi Kashi Vidyapith University, Varanasi; the director of the National Atlas and Thematic Mapping Organisation and the Surveyor General of India. He was also the recipient of the Commonwealth Geographical Bursary and a fellow of the Royal Geographical Society. He has authored and edited about eighty books and over 135 research papers. His well-known books are *Census Mapping Survey*; *Population, Settlement & Development in Zambia*; *Geography of India*; *Population Geography*; *Digital Remote Sensing*; and *Transformation of Survey of India*.

Dr Nag was the UN consultant on census mapping in Oman and the chairman of the ICA Commission on Population Mapping and a member of the IGU Commission on Population Geography. At present, Dr Nag is the director of the SHEPA Group of Educational Institutions in Varanasi.

Dr Amrita Paul is an assistant professor and the Head of the Department of Geography at Belda College, Vidyasagar University, West Bengal, India. She has also contributed eleven research papers and co-authored a book entitled *Bhougolik Tathyabigyan* (Geographical Information Science) in Bengali.

PREFACE

While writing the textbook on *Population Geography* in 2020, it was felt that the issues related to depopulation and redistribution needed further investigation. It was also realized that the world is pre-occupied with over-population, population pressure on resources, alarming growth rates, fertility, unemployment, etc. On the other hand, the issues related to reductions in population growth rates, increasing longevity, the greying population, reducing fertility rates and overall depopulation have not been given due consideration. There are hardly any theories or models to look into the situation arising out of the slow-but-sure reduction in human numbers.

Depopulation has led to redistribution as well. A minimum level of strength is required to maintain, sustain and grow institutions, infrastructure and services. Reduced numbers get in the way of the survival of an organization or unit. In developed countries, in particular, infrastructure does exist, but strength is getting reduced, falling short of threshold numbers. As a result, there has been a relaxation in immigration policies, and incentives have been given by the developed countries to qualified and trained people from developing countries. Nevertheless, the developing countries themselves are facing similar problems. In larger countries, the regional variations in Total Fertility Rate (TFR) and Women Child Ratio (WCR) are quite apparent. Hence, there has been redistribution within these countries as well.

As a result of depopulation, the world economy is becoming women-centric. Late marriage, the acceptance of family planning, economic independence to women, control of their own bodies, etc., have led to low fertility. Women have to choose between *career* and *child*. Economic growth has been hit by low fertility. The dipping percentage of children and the increasing ratio of the greying population have put a burden on the national economy. These developments have added new terms and phrases in population research; some of these are demographic destiny, counter urbanization, urban deconcentration, and population collapse.

The situation arising out of COVID-19 (2020–22) gave me an occasion to study depopulation and redistribution in more detail. We could practically

see, feel and visualize the consequences. Fortunately, Amrita Paul, my student, who had, by then, been awarded her Ph.D. degree on her thesis on the redistribution of population, became interested to join me in writing this book. My earlier experiences in dealing with population-related issues, nationally and globally, became handy. Further, due to our background, this volume is slightly tilted towards India. Moreover, during the time of writing this book, India became the country with the largest population in the world. However, exact figures will only be available when its forthcoming census is conducted.

On the surface, it appears that all of the population processes are smooth and normal, and that there have been no major upheavals. But, if we scratch a bit, we will find several undercurrents happening concurrently, which ultimately contribute towards the composition of the population in any country. Further, such transformations, adjustments and their combinations have made every country unique. Their population policies had a role to play as well. Nevertheless, we have tried to cover the global issues and patterns. We had to depend mostly on data that is generally available from the national statistical offices. As a result, most of our analysis is based on country-level data. In addition, information was also collected from the UN agencies, PEW Research Centre, Population Research Bureau (PRB), etc. Since the population data has been taken from a variety of sources, the projections do differ. Nevertheless, this matter has been kept in mind while writing the book.

Recently, population undercurrents have been swift and could not be captured by decadal censuses or similar surveys. In addition, COVID-19 has further aggravated, disrupted and changed the usual population activities. Several countries have not initiated their 2020 round of censuses or have delayed the surveys. Hence, we had to depend on alternative sources to capture rapid variations. These new sources were blogs, websites, social media, the internet, digital newspapers, and online reports. Surprisingly, the electronic media has become quite sensitive to population issues (*vide* Annexure C). Furthermore, our target year of 2050 is not very far away. It would be a matter of interest to see how things unfold during this short span of twenty-seven years or so.

We feel that this is the right occasion to remember Prof. John Innes Clarke (1929–2018). Considering his contributions in the field of population geography, we would like to dedicate this volume in his honor. He was the pro-vice-chancellor of the University of Durham and the chairman of the International Geographical Union (IGU) Commission on Population

Geography (1980–88), and was a recipient of the *Order of the British Empire* and the *Victoria Medal* of the Royal Geographical Society. He was my mentor as well.

We take this opportunity to acknowledge our colleague, Late Dr G.C. Debnath of the Department of Geography, Viswa-Bharati University for helping us in preparing this manuscript. We also thank Ms. Lorna Pierce for facilitating us in proof reading.

We are sure that our attempt to understand and analyze population issues differently will be appreciated by all concerned.

Varanasi/Kolkata Prithvish Nag
July 11, 2023

CHAPTER 1

INTRODUCTION

The individual man is a genetically uniform entity and with his surrounding environment makes an individual ecosystem. The ecology of this individual is concerned with the way he interacts with his physical environment—physiologically and psychologically. The environmental part of the ecosystem supplies the energy and raw materials needed by the individual for living and for the production of young ones. At this level of integration, one is concerned with "human ecology." Man needs food, along with good housing and clothing, and health, education, electronic gadgets and security; this is called "quality of life" or social wellbeing. Thus, man and his consumption of more food than all the animals put together became the central theme of the geography of man, or the geography of population, and has been considered as the well-established core of population geography.

The geography of population is one of the most recent sprouts from the venerable trunk of geographical science. The varying content and methodologies of different disciplines studying population notwithstanding, each social science has made valuable contributions towards the understanding of the spatio-temporal patterns of population (Woods 1979). Glenn T. Trewartha of the United States was, perhaps, the most important personality to elevate population studies to the status of a systematic branch of geography. He defined population geography as a discipline concerned with understanding the regional differences in the earth's covering of people (Trewartha 1969).

In order to understand population geography, we should have a clear-cut definition of the terms "geography" and "population." The definition of "geography" may be viewed as the study of the physical world, its inhabitants, the interaction between the two, and the patterns and systems involved; or the study of relationships between humans and their environment by emphasizing a spatial and environmental perspective at a variety of scales. Geography can also be considered as a spatial discipline or the study of humans interacting with their environment, including the physical

environment, the built environment and socially constructed spaces; and a spatial perspective of all human and physical phenomena. A “population,” on the other hand, can be defined as a group of individuals of the same species residing in a particular geographical area at a particular time and functioning as a unit. From an ecological point of view, population refers to all the organisms that constitute a specific group or occur in a specified habitat. In statistics, it is the set of individuals, items, or data from which a statistical sample is taken, also called a universe.

Population geography or the study of the spatial aspect of human existence constitute a recently developed and specialized branch of human geography. From the very first journey, the subject matter and the full content of this sub-field have been debatable. In 1953, Trewartha, of the University of Wisconsin, delivered the presidential address at the Association of American Geographers (AAG) annual meeting in Cleveland, Ohio. The title of his address was “A Case for Population Geography.” He argued that the study of population, long neglected by the discipline, deserved a more prominent position in geography's agenda. He wanted to put population on the map of geographic analysis. He was, in fact, unusually sensitive to the role that humans play in shaping our perception and study of the physical world, and it was that sensitivity that opened his eyes to the importance of population-environmental interactions taking place in the world. In that particular year, Trewartha offered a tentative scheme for the content of population geography: (a) geography of population in the past; (b) population numbers (including distribution, density, growth and migration, etc.); and (c) qualities of population (including physical and socio-economic qualities). Therefore, this work came to be widely regarded as a "call to arms" for geographers interested in population-related issues, and, in the years following, population geography emerged as a distinct systematic specialty within the discipline.

Population geographers were involved in the macro- and micro-level studies of the dynamic relationships between population characteristics and the environmental and resource matrices, which sustain the population base. Nonetheless, geographers are much more interested in population as part of their general enquiries into regional studies with a focus on spatial distribution. Thus, the following aspects became the broad and fundamental themes of the study of population geography:

(a) *Population growth in relation to development at the national, regional and global levels,*

(b) Components of population growth: fertility (birth), mortality (death) and migration (mobility),
(c) Population composition: age-sex differentials, marital status, households and family structure, ethnicity, race, religion, and education,
(d) Population distribution: global, regional, rural and urban,
(e) Labor forces,
(f) Population projection at macro and micro levels.

The term demography is derived from the Greek word "demos" meaning a human being. The term seems to have been coined for the first time by a Belgian statistician, Achille Guillard, in 1855, in the article entitled "*Elements de statistique humaine, ou demographique comparee"* ("Elements of Human Statistics or Comparative Demography") (Shryock and Siegel 1971). Like all other disciplines, demography admits to a narrow and a wider definition. In narrow terms, demography is defined in the *Multilingual Demographic Dictionary*, brought out by the International Union for the Scientific Study of Population (IUSSP), as "the scientific study of human populations, primarily with respect to their size, structure and development; it takes into account the quantitative aspects of their general characteristics" (Van de Walle 1982). In a wider perspective, demography overlaps with a number of other disciplines such as economics, sociology, social psychology, law, political science and reproductive physiology (Bogue 1969; UN 1958). Thus, demography in its wider definition as population studies is multi-disciplinary in nature and in recent years has attracted scholars from various other disciplines, especially economics and sociology, who have made valuable contributions to its development. These scholars have been primarily associated with their parent disciplines but interested in the population phenomena. They can be designated as sociologist demographers, economist demographers, etc. *Spatial demography*, while similar to population geography, is the term usually used to refer to the formal empirical methods used to make these connections between people and places. The importance of a spatial perspective for demographic research has received considerable attention over the past few decades. Geographers were amongst the first, but not the only population scientists, to embrace the importance of spatial thinking. Today, population geography is a subfield of the discipline of geography. It is also a subfield of demography.

Population geography addresses the spatial distribution, characteristics, and variation of the population. Often, this term and spatial demography are used interchangeably. More specifically, however, population geography is a sub-disciplinary field of geographic research that addresses demographic

issues and population processes in an explicitly spatial manner, with a focus on the connection between people and places. Thus, it is a scientific study of human populations in their aggregate with regard to their size, composition or structure, spatial distributions and developments, or changes in these, over time. In its wider definition, where it is also called *population studies*, it not only deals with levels and changes in the size, composition and distribution of the population but also with the causes and consequences of the levels and changes. According to UNFPA (Wikipedia):

> *The unique advantage of the census is that it represents the entire statistical universe, down to the smallest geographical units, of a country or region. Planners need this information for all kinds of development work, including: assessing demographic trends; analysing socio-economic conditions; designing evidence-based poverty-reduction strategies; monitoring and evaluating the effectiveness of policies and tracking progress towards nationally and internationally agreed development goals.*

An increasing number of young population geographers have started taking up research problems that speak of a much-desired departure from complete dependence upon census data. An expanding number of such studies will, of course, bring new methodological grounds. Besides, the field study and the increasing use of primary data are also undergoing significant changes. Though, of course, the collection of data from the field and conducting fieldwork in India have their own limitations and problems, like illiteracy, biases, suspicion, security problems, and general apathy-related handicaps. So, field works among geographers has not achieved the level of development commensurate with population censuses.

Population Counting

For a country, the counting of the quantity and quality of the population is the basic indicator of production, distribution of wealth and the overall development and advancement of the nation. In order to make and implement plans, it is necessary to collect sufficient, reliable, detailed data regarding all aspects of the population. Although the population census of any country, worldwide, is the primary source of the basic benchmark statistics, covering not only the settled population but also the homeless and nomadic groups, it is considered as a secondary data source. In this regard, the collection of primary population data is significant too. The importance of population counting lies in the fact that

(a) An authentic census figure helps in present and future developmental planning, for all sectors of the economy.

(b) It helps in showing the rate of population growth or decline, thereby assisting the government with its policy formulation.
(c) A good census helps the government with the equitable allocation of resources among its citizenry.
(d) It shows the rate at which people move from one place to another.
(e) A population census is used to determine the number of people living in a given geographical territory.
(f) Census data is an essential tool for evidence-based planning, for monitoring and evaluating plans/policies framed on the basis of census data.
(g) Census data are used by researchers for the analysis of programs launched by the government.

Data or statistics may be viewed as falling into two main categories: primary and secondary. Whether the statistics are primary or secondary, descriptive or inferential, every analyst should take care of a number of issues, like validity of data, reliability of data, data privacy and data suppression. Other sources of demographic data collection are surveys, registrations, migration reports, estimates and projections. Some statistics may be selectively reproduced or rearranged in such secondary sources as compendia, statistical abstracts, yearbooks, unpublished worksheets, data sets, etc. The United Nations has been a prime source of secondary demographic data on an international scale.

A population census is a primary source of basic national population data. It refers to the collection, compilation, evaluation, analysis and publishing of information about the population of a country, or of a well-delimited part of a country, officially. The information pertains to a specified time and can be sorted for current and future analysis. It is actually a stock take of the human resources of a country and the living conditions of the people at one point in time. It serves as a benchmark for all types of socioeconomic development plans, administrative activities and demographic research. It provides us with information on trends in population growth, changes in the age and sex structure of the population, the course of mortality and fertility, migration and urbanization, etc. (Nag 1984).

A census is the procedure of systematically calculating, acquiring and recording information about the members of a given population. The *United Nations* defines the essential features of population and housing censuses as the "individual enumeration, universality within a defined territory, simultaneity and defined periodicity," and recommends that population censuses be taken at least every ten years. The United Nations recommendations

also cover census topics to be collected, official definitions, classifications and other useful information to coordinate international practices.

Interest in Population Studies

Different aspects of population have been studied by different disciplines, agencies, governments and individuals. The objectives may have been different, but the data sources, basic approaches and findings have a degree of similarity. Hence, population has been analyzed by demographers, sociologists, economists, environmental scientists and statisticians. But the spatial pattern has been the strong point of geographers. The population geographers have liked to observe the pattern over space since the time of Trewartha (1953) and even earlier. This approach has been closer to that of spatial demography. At the international level, the International Geographical Union (IGU), an affiliated scientific body of the International Council for Scientific Unions (ICSU), promoted population research in geography. Similarly, the International Cartographic Association (ICA) also appointed a commission to promote research in population or census mapping. Population has also been the focus of study of world bodies like the United Nations Fund for Population Activities (N.N.F.P.A.), the United Nations Development Program (UNDP), the International Union for the Scientific Study of Population (IUSSP), the World Bank, the International Social Science Council (ISSC) and others. It is interesting to note that the issues at the international level may differ considerably regarding the individual country. In several cases, the population policies have become so effective that the international boundaries become the demographic divide. There have been attempts to analyze the researchers at an international level under the aegis of the IGU and the ICA. Both international bodies have had full commissions, as have other groups, for studying different aspects of population. The contributions of the IGU Commission have paved the way to make more significant efforts to study the causative factors of the dynamics of population change and the redistribution of population.

Though it is a rather difficult task to categorically sort out the population-related issues and key questions, it can be mentioned that in the early stages of the development of population geography as a discipline the concern was with the static and macro-aspects of population in relation to the environment and its resources. Now, it is observed that this branch of geography has come to the forefront of population studies. Its broad themes are of fundamental importance to the study of population geography. They are as follows:

(a) Population growth in relation to development at the national, regional and global levels.
(b) Components of population growth: fertility (birth), mortality (death) and migration (movement).
(c) Population composition: age-sex differentials, marital status, households and family structure, ethnicity, race, religion, and education.
(d) Population distribution: global, regional, rural and urban.
(e) Labor forces.
(f) Population projection at macro and micro levels.

Nevertheless, population change studies became more inclined towards issues like mortality trends at advanced age, changing fertility pattern, infertility, mobility, return migration, depopulation, and the redistribution of population.

Population Cartography

Population maps are useful to decision-makers and researchers because they powerfully illustrate the spatial heterogeneity of people within a country. They are of special interest to environmental scientists and other researchers working with spatial information on land cover change, ecosystem, goods and services, infrastructure development, market integration, and similar topics with locational aspects. It is also important to stress the development of population cartography. The IGU has always had a full commission related to population geography, where population cartography was given due importance. The book *Census Mapping Survey* was published in 1984. Although it was an IGU Commission publication, it was released in collaboration with the ICA Commission on Population Cartography. *Census Mapping Survey* was a joint project of both commissions (Nag 1984). It contained about twenty-two national reports covering about 53% of the, then, world's population. Attempts were made to highlight the following aspects of (a) nature of population grouping, (b) census district as a tool for mapping, (c) links between pre-census and post-census cartography, (d) census cartography with special reference to last published census, (e) relationship between census cartography and population cartography, (f) scope for automation in census mapping, and (g) census maps as an aid to study population cartography.

Similarly, the ICA also had a full commission on population cartography (Nag 1989) with the objectives of (a) the compilation of an inventory of maps used in conducting the collection of data on population in various countries and to suggest an optimal methodology and design for the

production of these maps, and (b) the analysis of existing population maps of metropolitan regions to suggest methods, designs and content criteria for basic population maps (population density, change and fertility maps) and to prepare a set of population maps using the suggested criteria for a selected metropolitan area in a third-world country.

Population Issues

A study of population needs a multi-dimensional approach, as the population-related variables are linked in a complex system of cause and effect. In fact, the dynamics of the relationship between population, on the one hand, and resources, the environment, and sustainable development, on the other, has turned out to be an intricate phenomenon posing a number of problematic issues. It cannot be disputed that our existing capacity to substitute and recycle resources is not commensurate with the depletion rate of those resources and the deterioration level of the environment following unparalleled technological advancements, industrial developments and urbanization.

The rapid and explosive growth of population, especially in the second half of the last century, and its multi-faceted complex consequences have caused grave concern to planners as well as academicians, as is manifested by large volume of recent literature on this subject. Throughout, population-growth-related issues have acquired paramount significance in the entire development syndrome, especially in view of the deteriorating resource situation, environmental degradation and the resultant poor quality of life, which are all ascribed to rapid population growth. To illustrate the problem, examples have been drawn, from developing countries, in general; in a third-world country like India, in particular, the situation is grim owing to the huge population size and its fast rate of increase, poverty, disparities and social injustice.

Also, we have not been able to obliterate the mismatch between the development of the socioeconomic bases of developing countries and the fast-increasing population pressures, nor could we check the process of unbalanced development at different social and regional scales; thereby, virtually disallowing distributive justice to set in. To this, much has been added by the cumulative impact of British policy in countries like India to produce only exploitable and unskilled labor. So, a logical question comes around: how to accommodate and support, under the existing constraints, the huge surplus and incessant additions to the teeming millions or billions? As a matter of fact, there is a series of such questions, which are divergent

but interrelated in some way or another. All these have emerged as hard facts making them a focus of global interest and it will not be irrelevant to discuss them.

The number and quality of population is an asset, no doubt, because the labor force requires a high rate of population growth; but it is a negative factor too depending on the spatio-temporal context with which it is concerned. We all can admit that a country's greatest wealth is its "people," as human capital is even more important than physical capital for increased production. In resource creation, it's a known statement that nature is his base and culture is his weapon. Boserup (1965) hypothesized that population growth, rather than being a hindrance to economic growth, is actually a prerequisite for development; the population-resource or the man-land ratio being modified by out-migration.

Much has been said about the role of population as a negative factor. Such as, "over-population and the rapid multiplication of people are ultimately concerned with most aspects of the current human predicament, including the rapid depletion of non-renewable resources, deterioration of the environment, ecological disasters, rising tensions and violence in the world" (Souza 1990). Rapid population growth hinders development by raising the dependency ratio, reducing the amount of national income that might otherwise be available for saving and investment, and diverting a large portion of new investment into replicating existing economic and social facilities for the benefit of larger numbers rather than deepening and broadening the capital stock for the creation of a higher per capita income (Coale and Hoover 1959). More pathetic are the situations where population growth rates have outstripped the abilities of the countries to provide basic necessities. Furthermore, the sprawling growth of the urban population is obviously causing more pressure on the availability and quality of basic civic amenities, adding to the existing magnitude of unemployment in urban areas.

Contemporary Concerns

If we consider the global trends in population dynamics since the very first decade of present century and also a projected population scenario up to 2050, we can find an absolute deviation from the very traditional concept, regarding human population throughout the world. A lowering of the fertility rate, the ageing population, higher life expectancy, the lower rate of immigration, a new trend in marriage patterns, new-age redistribution and the regrouping of population at regional, national and international levels,

the upliftment of women's status and an emerging world economic order, and, above all, the very remarkable depopulation and shrinking nations are going to transform the future generations' mindsets and lives by 2050.

Seen within the continuity of time, the year 2000 was probably no more likely than any other year to be a significant threshold, certainly for population change. And yet, for many people, it was a target for living, working and forecasting, a focus for opportunities for change and a launch-pad for the future. So, its significance must not be ruled out (Clarke 1997). Predictions regarding population are generally more difficult than those of physical systems, as human systems hardly follow laws and tend to transform very quickly. Nevertheless, futurology must look forward to the planned growth of a nation; however, one should be serious and cautious about the fogginess of future. Therefore, it has been recognized as *an impossible but unavoidable task.*

The *2020 World Population Data Sheet* indicates that the world population is projected to increase from 7.8 billion in 2020 to 9.9 billion by 2050. This level represents an increase of more than 25 % from 2020. The current global total fertility rate is 2.3 births per woman, although ninety-one countries and territories have registered fertility rates below replacement level (2.1 births per woman). In contrast to this high population growth and the related issues, the trend of growth is moving towards a greying population throughout the world, especially in Europe. It was November 24, 2021, when India's government declared that the country's fertility rate had dropped below the replacement rate (two children per woman), which indicates an insufficiency of new births to cope with a steady population structure for the future, like many of the richer nations (Brazil, Russia, China) are going to face. It is no surprise that demographers are now explaining this falling fertility scenario as the "demographic contagion." According to the managing editor of the *Times of India,* more babies were born in India in 2003 than any year before and after (Website 1*).

> *All these indicators point in the same direction – Indian family size is shrinking faster than most people think. It took only 14 years for the fertility rate to fall by 50% (from 3 to 2) in India, whereas in Bangladesh – globally acclaimed for birth control – a similar fall took 17 years.*

Following the *U.S. Census Bureau's Population Projections 2017*, the 2030s will be marked as a "Transformative Decade" and will emerge as a decade of important demographic momentum due to heavily declining fertility rates. The US grew at a rate of 0.2 % from January 1, 2021, to this year, while the world was growing at a rate of 0.9 % at the same time, as