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Family Planning and Environmental Sustainability: Assessing the Science

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Sustainability
Assessment

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Report available in online interactive PDF at fpesa.net and www.worldwatch.org



Is there a scientific evidence base demonstrating that the use of family planning contributes to environmental sustainability? This report explores that question based on a two-year collaborative review of more than 900 peer-reviewed research papers from around the world published from 2005 through early 2015.

No scientific discipline systematically examines or confirms the influence of voluntary family planning on environmental problems. Looking at pathways that lead through the slowing of population growth and the empowerment of women, however, the Family Planning and Environmental Sustainability Assessment (FPESA) found a wide-ranging literature generally affirming that this influence is both real and constructive.

FPESA identified considerable evidence supporting—and very little refuting—the statement that the practice of voluntary family planning promotes environmental benefits and that expanding access to it can help bring about an environmentally sustainable world that meets human needs. The diversity of researchers interested in the family-planning connection to the environment is high, the report also concludes.

The report features the project's findings, perspectives on major related issues by eight authors, and an annotated bibliography containing assessments of 50 of the most compelling papers relevant to the linkage.



Through research and outreach that inspire action, the Worldwatch Institute works to accelerate the transition to a sustainable world that meets human needs. The Institute's top mission objectives are universal access to renewable energy and nutritious food, expansion of environmentally sound jobs and development, transformation of cultures from consumerism to sustainability, and an early end to population growth through healthy and intentional childbearing.



INTERVIEW: FAMILY PLANNING AND ENVIRONMENTAL SUSTAINABILITY • ASSESSING THE SCIENCE



Family Planning and Environmental Sustainability: Assessing the Science



An International Network of Research Assessors



Hypotheses

1. Wider use of family planning contributes to environmental sustainability.
2. Aspects of this linkage draw interest from a diversity of researchers of both sexes and from developing as well as developed countries.



>> PERSPECTIVE

Shared Values

Robert Engelman

The work of the Family Planning and Environmental Sustainability Assessment (FPESA) project is consistent with the consensus of those in the field of sexual and reproductive health and rights and related fields that the use of family planning must always be based on the fundamental human right of all individuals and couples to decide for themselves the timing and spacing of pregnancy. Even if some of the scientific evidence that we assess suggests an urgency to slow the growth of population to ease

0
939

In the 939 papers published since 2005 that we have examined so far, we have not identified one that argued for a weakening of the rights basis of family planning.

Perpetual vigilance against such a return of the control mentality is essential. But absent evidence that such a threat exists, the FPESA project has seen no reason to shy away from evidence that population growth threatens environmental sustainability. At the same time, we hypothesize that there also are

non-demographic pathways through which family planning contributes to sustainability, and we explore these as well.²

The FPESA project has seen no reason to shy away from evidence

In part to dem

Voluntary family planning

(available, accessible, acceptable and good quality — client focus, contraceptive method mix, informed consent, etc.)

Reduces fertility, raises reproductive age

Slower population growth, older populations, eased relocation pressure

Reduces impact on environment, enhances human resilience

Environmental sustainability

(zero net greenhouse emissions, natural extinction rates, healthy land and aquatic ecosystems, sufficient fresh water, fertile soils, stable renewable and non-renewable resource availability, trivial toxic releases, resilience to unmitigated environmental change, etc.)

Facilitates personal control of birth timing and frequency

Smaller families, improved life planning

Empowers women — aiding education, stewardship, governance

Possible confounding effect:
Higher per-capita resource consumption

This section to be filled out by FPESA network collaborators:

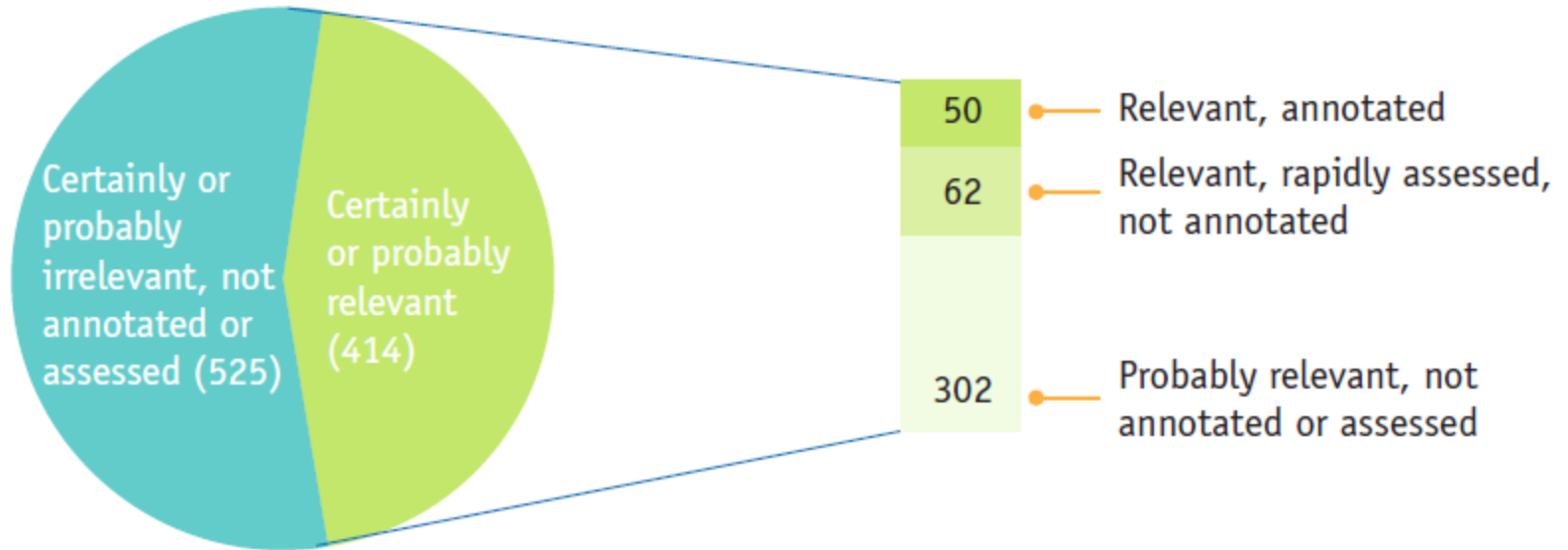
Questions 1 through 7 may be answered simply by highlighting or boldfacing one of the three options. Optional comments may be added below each question. It is not necessary to respond to all questions. When complete to your satisfaction, please email as an attached document to Yeneneh Terefe at yterefe@worldwatch.org.

Annotator's Name: _____ Date: _____

1. Is the methodology sound? Yes No Uncertain
2. Are the data and evidence presented understandable and believable? Yes No Uncertain
3. Do the analysis and conclusions follow logically from the evidence presented?
Yes No Uncertain
4. Are the research, analysis and conclusions reasonably free from obvious ideology, bias or pre-conceived opinions?
Yes No Uncertain
5. Could this research be reproduced? That is, could it be repeated in this or another form to generate findings that would either support or undermine its conclusions?
Yes No Uncertain
6. Does this report help answer the key question under consideration in the FPESA project: whether better access to, and more use of, voluntary family planning is likely to support environmental sustainability? (For FPESA's conceptual framework, a work in progress designed to illustrate aspects of this complex linkage, [click here](#).)
Yes No Uncertain
7. Strength of article (highlight response):
Very good Good Neutral Weak Very weak

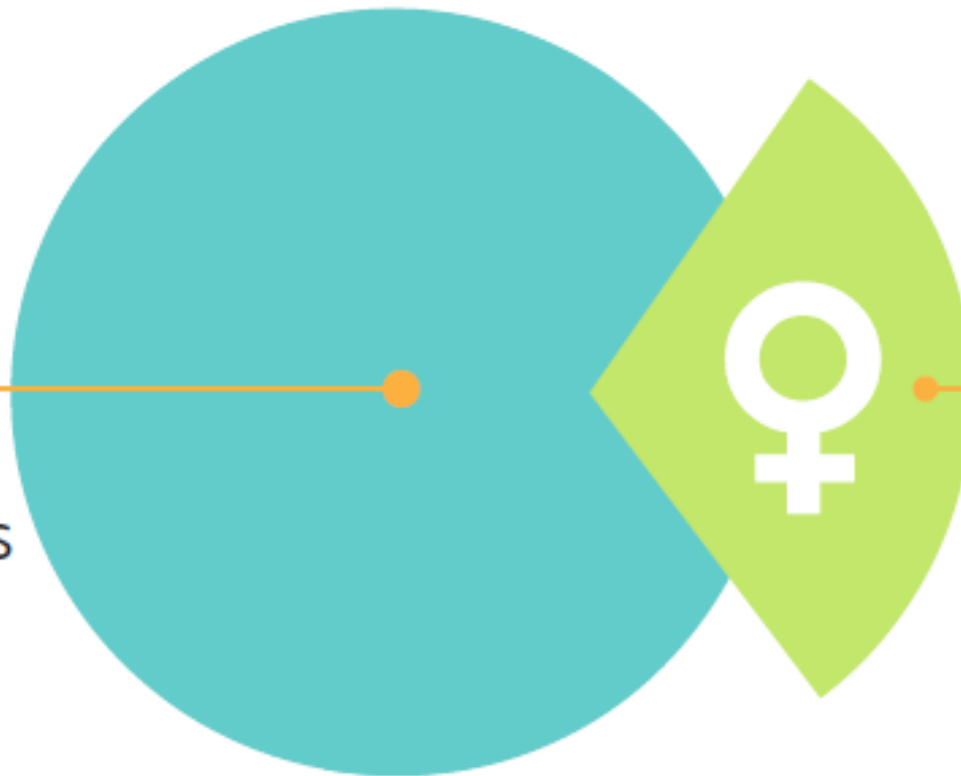
939 Papers Reviewed:

How They Break Down by Relevance, Annotation, and Assessment



464

Total authors
of 112 articles
whose sex
could be
determined



133

Contributing
women
authors



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SPECIAL ARTICLE

Declines in Unintended Pregnancy in the United States, 2008–2011

Lawrence B. Finer, Ph.D., and Mia R. Zolna, M.P.H.

N Engl J Med 2016; 374:843–852 | [March 3, 2016](#) | DOI: 10.1056/NEJMsa1508575

BACKGROUND

The rate of unintended pregnancy in the United States increased slightly between 2001 and 2008 and is higher than that in many other industrialized countries. National trends have not been reported since 2008.

METHODS

We calculated rates of pregnancy for the years 2008 and 2011 according to women's and girls' pregnancy intentions and the outcomes of those pregnancies. We obtained data on pregnancy intentions from the National Survey of Family Growth and a national survey of patients who had abortions, data on births from the National Center for Health Statistics, and data on induced abortions from a national census of abortion providers; the number of miscarriages was estimated using data from the National Survey of Family Growth.

RESULTS

Less than half (45%) of pregnancies were unintended in 2011, as compared with 51% in 2008. The rate of unintended pregnancy

Finding: Contraception prevents unintended pregnancy. That slows the growth of population, based on the intentions of contraceptive users.

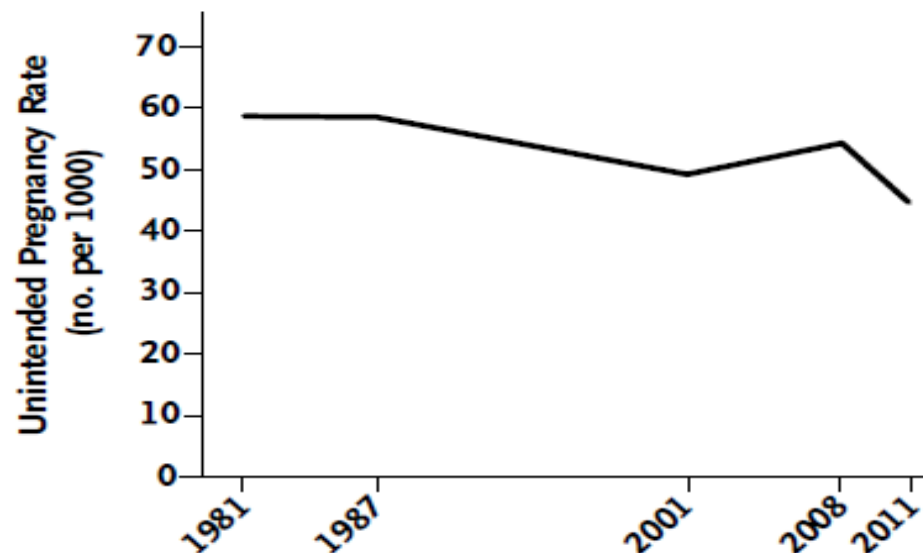


Figure 1. Rates of Unintended Pregnancy, 1981–2011.

Rates are reported as the number of unintended pregnancies per 1000 women and girls 15 to 44 years of age.

Adaptation to land constraints: Is Africa different?



Derek D. Headey^{a,*}, T.S. Jayne^b

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Rural nonfarm economy
Migration

ABSTRACT

Since the seminal works of Malthus and Boserup, scientists have long debated the impact of population growth and land constraints on the wellbeing of rural people. Today these concerns are particularly relevant to Africa, with its rapid population growth, very small farms, and chronic food insecurity. In this paper we examine adaptation to falling land-labor ratios using a comprehensive theoretical framework in which households faced with binding land constraints can respond in three ways: intensifying agricultural production, diversifying out of agriculture, and reducing fertility rates. Using cross-country data and drawing upon the existing literature, we reach three conclusions. First, population density is associated with reduced fallows and more intensive use of land but not fertilizer use or irrigation, indicating major challenges in achieving sustainable intensification or agricultural productivity growth. Second, there is little evidence of successful non-farm diversification in response to land pressures in Africa from domestic or international income sources. Third, rural Africans in land constrained countries desire smaller families, but have thus far benefited little from family planning policies. These findings underscore the need for a coordinated multi-sectoral approach to sustainably reduce poverty in the region.

Abstract

A growing and more affluent human population is expected to increase the demand for resources and to accelerate habitat modification, but by how much and where remains unknown. Here we project and aggregate global spatial patterns of expected urban and agricultural expansion, conventional and unconventional oil and gas, coal, solar, wind, bio-

A B S T R A C T


The large environmental challenge that Jordan faces today is the scarcity of water. Definitely, water is the significant feature in the population/resource equation where water resources in Jordan are limited and the country's population has continued to rise. A high rate of natural population growth, combined with massive influxes of refugees, has transformed into an imbalance condition between population and water. Jordan's water resources are limited to support population in a sustainable manner. The situation has been intensified

- There won't be enough food and resources
- We will find a way to stretch natural resources

U.S. adults	59	38
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AAAS scientists	82	17
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The impact of population on CO₂ emissions: evidence from European countries

Inmaculada Martínez-Zarzoso , Aurelia Bengochea-Morancho, Rafael Morales-Lage

Finding:
Slowing
Population
growth
In many
documented
cases slows pace
of environmental
degradation

Verifications of
I=PAT
(environmental
impact=population
x affluence x
technology)

Abstract

This paper analyses the impact of population growth on CO₂ emissions in European Union countries. Traditionally, researchers have assumed a unitary elasticity of emissions with respect to population growth. In this study population is treated as a predictor in the model, instead of being included as part of the dependent variable (per capita emissions), thus relaxing the above-mentioned assumption of unitary elasticity. We also contribute to the existing literature by taking into account the presence of heterogeneity in the sample and considering a dynamic specification. The sample covers the period 1975–1999 for the current European Union members. Our results show that the impact of population growth on emissions is more than proportional for recent accession countries whereas for old EU members, the elasticity is lower than unity and non significant when the properties of the time series and the dynamics are correctly specified. The different impact of population change on CO₂ emissions for the current EU members should therefore be taken into account in future discussions of climate change policies within the EU.

Keywords

CO₂ emissions – European Union – Panel data – Population growth

Global demographic trends and future carbon emissions

Brian C. O'Neill^{a,1,2}, Michael Dalton^b, Regina Fuchs^c, Leiwen Jiang^a, Shonali Pachauri^c, and Katarina Zigova^{d,2}

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Edited by John Bongaarts, Population Council, New York, NY, and approved August 27, 2010 (received for review April 6, 2010)

Substantial changes in population size, age structure, and urbanization are expected in many parts of the world this century. Although such changes can affect energy use and greenhouse gas emissions, emissions scenario analyses have either left them out or treated them in a fragmentary or overly simplified manner. We carry out a comprehensive assessment of the implications of demographic change for global emissions of carbon dioxide. Using an energy-economic growth model that accounts for a range of demographic dynamics, we show that slowing population growth could provide 16–29% of the emissions reductions suggested to be necessary by 2050 to avoid dangerous climate change. We also find that aging and urbanization can substantially influence emissions in particular world regions.

climate change | energy | integrated assessment | population | households

Statistical analyses of historical data suggest that population growth has been one driver of emissions growth over the past several decades (1–3) and that urbanization (2), aging (3), and changes in household size (2) can also affect energy use and emissions. Demographers expect major changes in these dimensions of populations over the coming decades (4). Global non-

scenarios using an energy-economic growth model, the Population-Environment-Technology model (PET) (13).

Methods

The PET model is a nine-region dynamic computable general equilibrium model of the global economy with a basic economic structure that is representative of the state of the art in emissions scenario modeling (*SI Text* has further description and references). To best capture the effects of future demographic change, we take an approach based on building principles from demography into a dynamic economic model by distinguishing among a large number of household types by household age (defined as age of the household head), size (number of members), and urban/rural residence in each region. We draw on data from national surveys covering 34 countries and representative of 61% of the global population to estimate key economic characteristics of our household types. We use these estimates to calibrate parameters in the PET model that represent household demand for consumer goods, wealth in the base year, and labor supply over time. To test the effect of demographic change, we develop a set of global household projections and use these to drive the PET model, computing the associated effects on emissions outcomes.

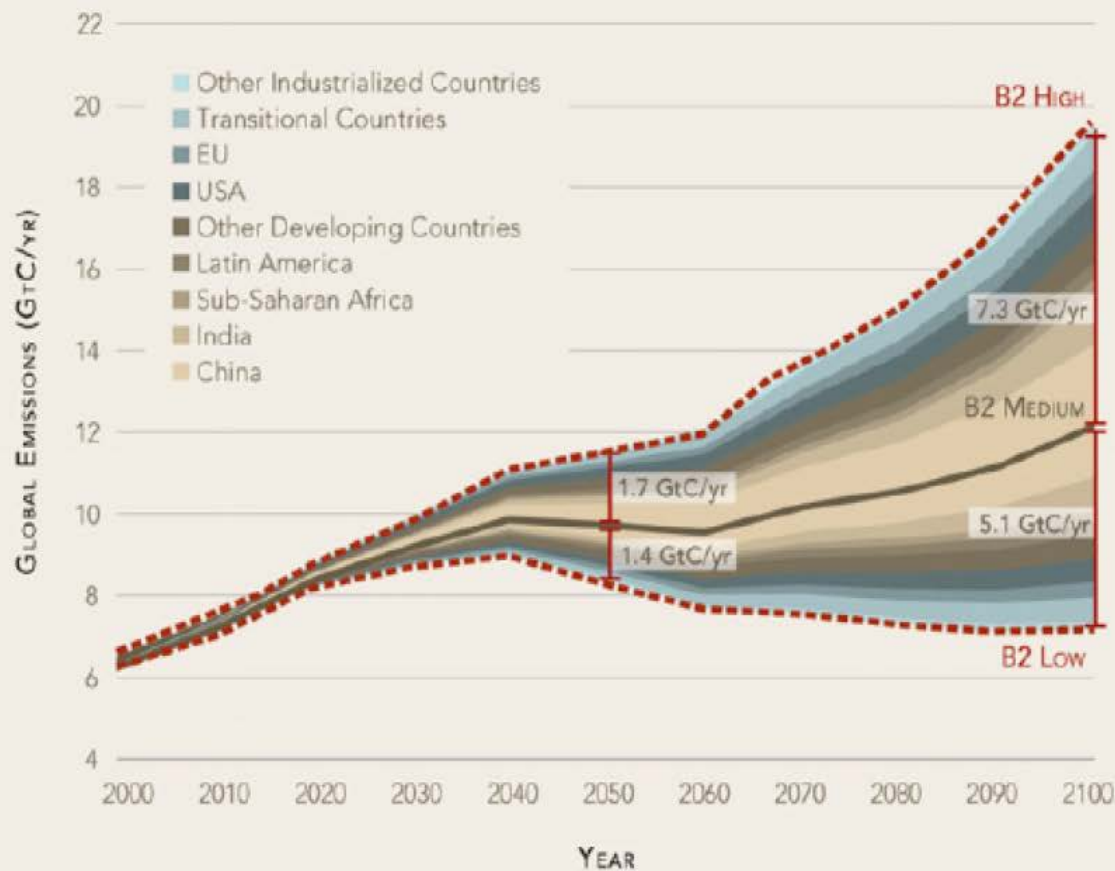


Figure 4.

Differences in Annual Carbon Dioxide Emissions, Based on Low, Medium, and High Projections of World Population Growth, 2000–2100, Globally (Dashed and Center Lines) and by Region (Shaded Areas)

Source: O'Neill et al., 2010.

Family Planning 3



Demographic change and carbon dioxide emissions

Brian C O'Neill, Brant Liddle, Leiwen Jiang, Kirk R Smith, Shonali Pachauri, Michael Dalton, Regina Fuchs

Relations between demographic change and emissions of the major greenhouse gas carbon dioxide (CO₂) have been studied from different perspectives, but most projections of future emissions only partly take demographic influences into account. We review two types of evidence for how CO₂ emissions from the use of fossil fuels are affected by demographic factors such as population growth or decline, ageing, urbanisation, and changes in household size. First, empirical analyses of historical trends tend to show that CO₂ emissions from energy use respond almost proportionately to changes in population size and that ageing and urbanisation have less than proportional but statistically significant effects. Second, scenario analyses show that alternative population growth paths could have substantial effects on global emissions of CO₂ several decades from now, and that ageing and urbanisation can have important effects in particular world regions. These results imply that policies that slow population growth would probably also have climate-related benefits.

Introduction

Human populations both affect and are affected by climate change. Demographic changes, including changes in population size, urbanisation, and the size and age composition of households, have implications for the ability of societies to adapt to the effects of climate

misleading about the importance of population-related variables.²⁻⁴ We review two types of evidence for how the emissions of CO₂ from the energy sector are affected by demographic factors such as population growth or decline, ageing, urbanisation, and changes in household size. First, we look at statistical analyses of historical data

Lancet 2012;380: 157-64

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This is the third in a *Series* of five papers about family planning

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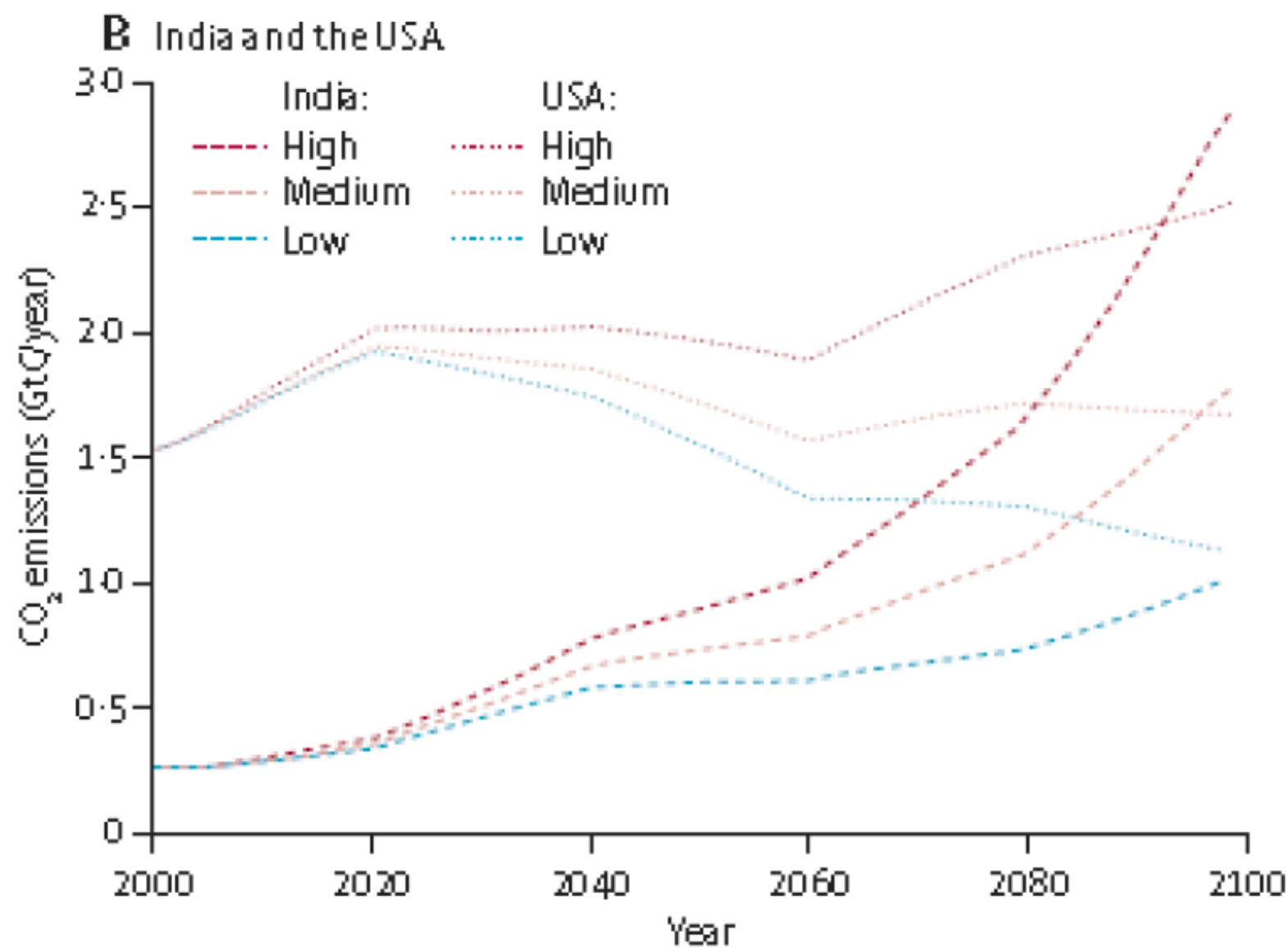


Illustration from the paper (page 161). Used by permission.

Demographic Change and Climate Change: The Nigerian Experience

SAJINI FAITH IWEJINGI (MRS)

Department of Geography and Regional Planning
Delta State University, Abraka-Nigeria

ABSTRACT

In recent time, there has arisen increasing concern about the effects of climate change in the tropical environment, Nigeria inclusive. This concern has prompted a range of researches into the causes and the effects of climate change as well as the possible mitigation measures that can be adopted. This paper examines the imprint Demographic change on Climate change in Nigeria. Sustained population increase as obtained from available demographic records implies a sustained increase in human activities which has resulted into population pressure. The pressure exerted on the resources of any geographic region manifests itself in one form of environmental problem or the other, climate change inclusive. The broad objective of this paper is to establish a link between demographic change and climate change in Nigeria. The specific objectives include; identifying the various human activities going on the different parts of the country and how they contribute to climate change, as well as highlighting some of the effects of Climate change in Nigeria. The method employed is fundamentally descriptive. The findings are that human factors are the causes of climate change in Nigeria as opposed to natural causes. Such factors include : population growth and the resultant population pressure; agricultural practices; deforestation; Urbanization; oil extraction activities and gas flaring in the Niger Delta

Urban growth, climate change, and freshwater availability

Robert I. McDonald^{a,1}, Pamela Green^b, Deborah Balk^c, Balazs M. Fekete^b, Carn and Mark Montgomery^d

^aThe Nature Conservancy, Worldwide Office, Arlington, VA 22203; ^bCity University of New York (CUNY) New York, NY 10031; ^cCUNY Institute for Demographic Research and Baruch College, New York, NY Department, Stony Brook University, Stony Brook, NY 11794-4384

Edited by Peter H. Gleick, Pacific Institute for Studies in Development, Environment, and Security, Oak review August 4, 2010)

Nearly 3 billion additional urban dwellers are forecasted by 2050, an unprecedented wave of urban growth. While cities struggle to provide water to these new residents, they will also face equally unprecedented hydrologic changes due to global climate change. Here we use a detailed hydrologic model, demographic projections, and climate change scenarios to estimate per-capita water availability for major cities in the developing world, where urban growth is the fastest. We estimate the amount of water physically available near cities and do not account for problems with adequate water delivery or quality. Modeled results show that currently 150 million people live in cities with perennial water shortage, defined as having less than 100 L per person per day of sustainable surface and groundwater flow within their urban extent. **By 2050, demographic growth will increase this figure to almost 1 billion people. Climate change will cause water shortage for an additional 100 million urbanites.** Freshwater ecosystems in river basins with large populations of urbanites with insufficient water will likely

This article model will affect water a with >100,000 pe 2000, 60% of the according to our d all urban growth g magnitude and ge availability for ur approach cannot a

We used data on tion) from the Glo (4), as well as dem demographic scen scenario, which pr size and national-l "Ecological Factor specific biome

Household dynamics and fuelwood consumption in developing countries: a cross-national analysis

Kyle W. Knight · Eugene A. Rosa

Published online: 28 August 2011
© Springer Science+Business Media, LLC 2011

Abstract Previous research has suggested a link between household dynamics (i.e., average household size and number of households) and environmental impacts at the national level. Building on this work, we empirically test the relationship between household dynamics and fuelwood consumption, which has been implicated in anthropogenic threats to biodiversity. We focus our analysis on developing countries (where fuelwood is an important energy source). Our results show that nations with smaller average households consume more fuelwood per capita. This finding indicates that the household economies of scale are, indeed, associated with the consumption of fuelwood. In addition, we found that number of households is a better predictor of total fuelwood consumption than average household size suggesting a greater relative contribution to consumption levels. Thus, insofar as declining average household sizes result in increased number of households and higher per capita consumption, this trend may be a signal of serious threats to biodiversity and resource conservation. We also found further support for the



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Women's status and carbon dioxide emissions: A quantitative cross-national analysis

Christina Ergas, Richard York*

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Finding: Evidence suggests that family planning contributes to women's status, which then contributes to sustainability.

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ABSTRACT

Global climate change is one of the most severe problems facing societies around the world. Very few assessments of the social forces that influence greenhouse gas emissions have examined gender inequality. Empirical research suggests that women are more likely than men to support environmental protection. Various strands of feminist theory suggest that this is due to women's traditional roles as caregivers, subsistence food producers, water and fuelwood collectors, and reproducers of human life. Other theorists argue that women's status and environmental protection are linked because the exploitation of women and the exploitation of nature are interconnected processes. For these theoretical and empirical reasons, we hypothesize that in societies with greater gender equality there will be relatively lower impacts on the environment, controlling for other factors. We test this hypothesis using quantitative analysis of cross-national data on the relationship between women's political status and CO₂ emissions per capita. Our results show that CO₂ emissions per capita are lower in nations where women have higher political status, controlling for GDP per capita, urbanization, industrialization, and other factors.



“Convince Them to Say It”

Kenneth R. Weiss



Camilo Mora



Ndola Prata



Usman Khan

Saplings and Contraceptives: Results From a Population, Health, and Environment Project in Kenya

May 28, 2015 By *Theresa Hoke*



East African countries like Kenya have made great strides in recent decades in increasing [access to modern contraception](#), leading to marked declines in [fertility rates](#). But [disparities remain](#).

The 2014 [Kenya Demographic and Health Survey](#) showed that rural women have a total fertility rate of 4.5 children per woman versus 3.1 for urban women, and the poorest women have more than twice as many children on average than the wealthiest.

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 **New Security Beat** @NewSecurityBeat 24m
Parfait Eloundou-Enyegue: Inequality in the #Sahel is higher in countries where women on average have <6 children: [jmp/1HRL0MM](#)
[Show Summary](#)

 **Feed the Future** @FeedtheFuture 28 May
Take a few minutes on #WorldHungerDay to learn more about how women help feed the world: [conta.cc/1g2TnHo](#)

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Swept Under the Carpet: The Psychological Side of Maternal Health

FEATURED VIDEO



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on the message. When asked what family planning has in common with tree planting and GBM's other core activities, all Green Volunteers were able to articulate at least one way in which their new responsibilities were consistent with the GBM mission; the most common response was that slower population growth reduces consumption of natural resources and environmental degradation. All 42 Green Volunteers indicated their interest in continuing their EHP activities; 35 spontaneously mentioned a desire to continue educating on family planning in particular.

“Integrating Family Planning Promotion into the Work Of Environmental Volunteers: A Population, Health And Environment Initiative in Kenya,” Hoke et al., 2015.

Thanks!

Universal
Access
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Joyce Yang

Wallace
Global Fund

Yeneneh Terefe

Colleen Cordes

