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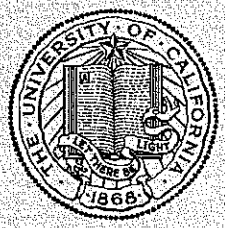
Population and the Environment:

Too Many People and/or Poor Management of Resources?



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University of California, Berkeley

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This publication has been edited by Erin McCormick and the layout was done by Rebecca Rivera. The production was coordinated by Urvashi Narrain and David Zilberman.

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Population and the Environment: An Introduction

by David Zilberman

On May 24, 1999, the Center for Sustainable Resource Development organized a conference entitled, Population and the Environment: Too Many People and/or Poor Management of Resources, as part of the Center's program on population and the environment. We are pleased to present these proceedings from that conference.

The Center for Sustainable Resource Development is located within the College of Natural Resources at the University of California at Berkeley. Our goals are to develop scientific and interdisciplinary policies that promote human well-being without degrading the environment and to educate professionals and policymakers who in turn will be instrumental in implementing these sustainable development strategies. We meet our goals by fostering and maintaining flexible working relationships among faculty, specialists and practitioners both within and outside the University of California. Since the Center's inception in 1994, we have initiated research programs on diverse issues such as global climate change, carbon sequestration, the economics and management of biotechnology, the future of California's Central Valley, and population and the environment.

Given the rapid deterioration of global environmental resources we feel that there is an urgent need to understand the mechanisms that affect natural resource and environmental quality and to identify policies that will promote sustainable development. Our program on population and the environment, which began in 1997 with the support of the William and Flora Hewlett Foundation, is built on this premise. Our program recognizes that there are numerous dimensions to the environmental problem and that policies for achieving sustainable development must be based on an understanding of this complex population-development-environment interface. Environmental problems are not just a matter of population growth and poverty but are also caused by high levels of resource consumption in developed countries and inappropriate institutions and policies in both the developed and the developing world. Our approach in developing sustainable

development policies is to integrate natural and social perspectives and to incorporate ethical considerations while recognizing the important role of incentives and well designed institutions.

With these goals in mind we started the population and environment program in the fall of 1997 with a special lecture series that brought in experts, both from within and outside the campus, to discuss key facets of the relationship between population and the environment. This series culminated in the development of a regular interdisciplinary, upper division undergraduate course on population, development and the environment that was first taught in the spring of 1999. The program continues to provide funds for dissertations and advanced research and to organize conferences that provide a forum for an exchange of ideas at the population-environment nexus.

The conference on May 24 began with a keynote address by Joel Cohen which was followed by three panel discussions. The first panel provided an overview of issues where Anthony Fisher addressed the issue of sustainability and Malcolm Potts the issue of the unmet demand for family planning. This was followed by two panels that addressed issues of population and the environment in developed and developing countries, respectively. We planned these two separate sessions in recognition of the inherent differences in population problems in developed and developing countries. In the developed country panel, Judith Kunofsky elucidated the Sierra Club's policy on population, Carolyn Merchant defined the concept of sustainability for industrialized nations and Cathi Tactaquin addressed the issue of immigration and the environment. In the developing country panel, Alain de Janvry addressed the issue of the synergies between population and natural resources, Sunita Narain the issue of consumption by the poor for survival and the rich for luxury and Urvashi Narain the many facets of deforestation in the Indian state of Gujarat.

This conference would not have been possible without the leadership and enthusiasm of Urvashi Narain and Rosemary Lucier, the encouragement of Dean Rausser and Joseph Speidel, and the financial support of the William and Flora Hewlett Foundation. Also these proceedings would not have seen the light of paper without the editorial assistance of Erin McCormik and Rebecca Rivera. The Center would like to thank them all. A video of the conference entitled, Population, Environment, Economics and Culture, is currently being produced by Rick Jaffe at the College of Natural Resources' Media Unit.

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Population and the Environment: Conference Overview

by Urvashi Narain

1. Introduction

On August 5, 1999, the New York Times carried an article entitled, **In Days, India, Chasing China, Will Have a Billion People**, in which Indians, due to their sheer numbers, were held responsible for India's poverty and its environmental problems. To quote the article, "Development experts and demographers say India is in danger of being overwhelmed by numbers as gains made in fields like education, health and agriculture fail to stay ahead of the surging population...Well before it reached a billion people, India was using water at an unsustainable rate...You have to wonder, what in the world happens when you add another half billion?"

Is India's population, or for that matter, the population in any poor country, if large, really responsible for its poverty and environmental problems? Responsible for famines, deforestation, air and water pollution, groundwater depletion and range land degradation? How does the relationship between population and the environment pan out in developed countries? Have we, in both the developed and the developing world, overshot the planet's carrying capacity? Are there just too many of us?

On May 24, 1999, the Center for Sustainable Resource Development and the College of Natural Resources, with the sponsorship of the William and Flora Hewlett Foundation, organized a conference entitled, **Too Many People and/or Poor Management of Resources**, to shed light on these questions. The participants, drawn from academia and nongovernmental organizations, raised a number of issues surrounding the debate on population and the environment, voiced opposing views, and suggested many different ways towards achieving sustainable development. This introductory piece is meant to give the reader a flavor for the issues that were covered in the conference. The reader is referred to the individual presentations for greater detail.

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ıg with migrants, the environmental community
ble for smog, pollution, water shortages, traffic
ɔirth rates within the United States, and for
/S-Mexico border. These arguments have led to
ɜration into the United States. Such attempts at
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he world's population and yet consume 30 % of
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le the United States. Attempts at scapegoating
eal human consequences of restrictive immigra-
variety of reasons—civil strife, wars, environ-
ɔnstant unemployment. Restrictive immigration
igrants the right to survive. Furthermore, there is
ıts who supply the much needed labor to the
se experience labor shortages because of its aging
ed that without the labor from Mexico and Asia
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hand, emphasized that restrictions on immigra-
tion stabilization within the United States
ve sustainability. According to Dick Schneider,
ates is the main driving force behind the growth
ast 20-25 years, population growth has caused
:gy consumption and much of the growth in its
ade of the 90s Consequently, without popula-
impossible to make progress on many of the
ıe United States today. Finally, since 50 % of
n is due to immigration, population stabiliza-
ced on immigration into the United States.
fault with this line of reasoning and pointed to
consumption that exists within the United
.sible for the bulk of resources that are con-
w migrants are seen driving sports utility

Does poverty cause environmental degradation?

A question at the heart of the population and environment debate is whether it's poverty or affluence that causes environmental degradation. Sunita Narain addressed this issue by saying that since the poor live off their environment, they do definitely lead to its degradation. However, she added, the scale of degradation caused by the poor is far less than that caused by rich societies with their high consumption levels. It is also important to distinguish between resource usage by the poor, largely for survival, and resource usage by the rich, more for luxury, and to recognize that the poor are more likely to protect and manage their environment than are the rich. Since the poor live directly on their environment, they bear the immediate consequences of poor management. Consequently, if they are given the power to initiate change, they will initiate better resource management. Rich people, on the other hand, are mostly unaware of the environment in which they live. Very rarely do they know where their water or food comes from. Since they are not directly affected by the consequences of their high levels of consumption, the rich are less likely to take decisions to improve environmental management.

This distinction between the levels of consumption of the rich and the poor leads to another issue, namely that, as the presently poor become rich they are bound to increase their scale of resource use. They will then have to deal with environmental problems that are linked with high levels of consumption. The question then is how should they deal with these new problems? Sunita Narain felt that there were unfortunately no models of development in the world that developing countries could learn from. The presently developed world is on a very unsustainable path and is creating problems, through global warming and ozone-layer depletion, for countries the world over. The western path of development is thus not to be emulated.

8. Sustainability

Despite their differences in opinions on the relationship between population and the environment, the speakers did agree on a common goal, namely, to achieve sustainable development. Anthony Fisher, Carolyn Merchant and Sunita Narain, though, chose to define the concept of sustainability differently.

Anthony Fisher defined sustainability as the ability of each future generation to be as well off as its predecessors. That is, for each generation to be endowed with whatever it takes (natural, produced and human capital) to produce a given

standard of living. A sustainable development path is then one that replaces whatever it uses from its inherited endowment with other kinds of capital that can yield the desired standard of living. When resources are such that they cannot be substituted, sustainability requires that the economy maintain a stock of these. With resources that can be substituted, sustainability requires that the economy maintain an aggregate capital stock to achieve a given living standard with no restriction being placed on the exact composition of the aggregate stock. Two questions left unanswered in this discussion are: (i) which elements, if any, of the natural capital stock are in fact non-substitutable; and (ii) at what level should these non-substitutable stocks be maintained. Anthony Fisher posed these questions as topics warranting further research.

Carolyn Merchant, on the other hand, drew attention to the importance of consumption levels in defining sustainability. She gave the example of the Netherlands where people have tried to imagine what a sustainable Netherlands would look like. In 1998, the population of the Netherlands was almost 16 million with a growth rate of 0.5 % which was expected to decline to 0.1 %. A sustainable Netherlands was defined for this population where people would have to adjust their consumption and production levels to be sustainable but still be able to live comfortably. This meant that consumer goods—televisions, washing machines, radio, and automobiles—would have to be more durable, meat consumption would have to be reduced by 60-80 %, timber usage by about 60 % and water usage by 32 %. In the year 2010, a Dutch person would have the choice of traveling each day either 15.5 miles by car, or 31 miles by bus, or 40 miles by train, or 6.2 miles by air. This meant that they could get from Amsterdam to the Earth Summit in Rio de Janeiro only once every 20 years. Energy in 2010 would be produced almost entirely by solar panels. Carolyn Merchant did not, however, discuss the mechanisms or policy instruments that would make such a Netherlands a reality.

Sunita Narain defined sustainability as essentially a political process. Since all human societies make mistakes, she said, a sustainable society is best defined as one that can learn from its mistakes and take quick corrective actions. Sustainability, therefore, is another word for local democracy or empowered decision making.

9. Policy Implications

Finally, the participants addressed the issue of how the goal of sustainable development would be achieved. Here, once again, the speakers had very different

Carolyn Merchant

College of Natural Resources, UC Berkeley

"The key...is population stabilization and how we move toward stabilization...Fertility levels, in large part, depend on whether women's basic needs for food, clothing, shelter and energy are being fulfilled."

I am first going to look at some trends in population and the environment, in developed countries. Then I will examine what the developed countries can do, particularly with respect to conserving our environment, as we move toward the year 2050.

I will begin by displaying Paul Erlich's famous graph from his 1968 book on the population bomb. It shows what Paul Erlich predicted at that time – that population would be 6.3 billion in the year 2000. That prediction has now been substantially altered largely because of fertility and population growth rate declines. According to the current estimate, today we have 6 billion people.

The next chart shows population in terms of total numbers. This graph is from the World Resource Guide for 1998. You can see that in 1990, the total population is still growing, but at a slower rate. Gains in average life expectancy, reduced mortality rates, and increased educational opportunities are responsible for a slowdown in the population growth rate. In 1960 the growth rate was 2.1 percent with a doubling rate of 33 years. In 1990 the growth rate fell to 1.8 percent with a doubling rate of 39 years. In 1998 the growth rate is 1.4 with a doubling rate of about 50 years. For the years 2005-2010, the global growth rate is predicted to fall to 1.2 percent. The global annual increment, as Joel Cohen told us this morning, has peaked and is falling. In 1990, it was 87 million people per year. In 1995, it declined to 81 million people a year, and it is predicted to go down to 80 million per year sometime between 2005 to 2010.

The United Nations World Resources Guide gives us population forecasts according to high, medium, and low projections. The projections for 2050, range from a low of 7.7 billion, to a medium of 9.3 billion, to a high of 11.2 billion. If we

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could achieve the low projection of 7.7 billion, the population in 2050 would not be much higher than it will be in the year 2000. Other institutes, however, make higher projections. YASSA, the Institute for Applied Systems Analysis in Austria, estimates 8.1 billion to 12 billion by 2050. These are all based on the hope that fertility rates will continue to decline, that life expectancy will continue to rise, and that developing countries will follow the demographic transition as developed countries have done.

If you want to look at the history of population changes, you look at world population history. The world population in 1950, was 2.5 billion and in 1998, it was 5.9 billion. It is predicted to soon reach 6 billion. We also have country-level population histories for the US, China and Russia. The US population in 1950, was 157 million, and by 1998, it was 273 million. Unlike in Europe, the US population is still increasing at 0.8 percent per year, and the forecasts predict that it will not decrease in 2005 to 2010. A large part of the U.S. population growth will be due to immigration. The population of Europe has a growth rate of zero at present, and is expected to decline to -0.1. The Russian population is currently growing at a rate of -0.3 and is predicted to decline further to 0.4. Hence, the population growth rates, as Dr. Cohen told us in his keynote address, began to decline in the 1970s and are continuing to decline in the less developed as well as the more developed regions of the world (which he rightly termed the "rich" and the "poor" nations).

The key, of course, is population stabilization and how we move toward stabilization. These charts from the World Resources Institute show that the population growth rate will continue to decline, except in Africa. Population growth rate declines depend on fertility declines. The chart shows that fertility in Africa is decreasing, but it still has the world's highest fertility level. Fertility levels, in large part, depend on whether women's basic needs for food, clothing, shelter and energy are being fulfilled. Women need equal access to education and employment. Equal pay for women is particularly important. Even at the University of California we do not have equal pay for women yet. Health care, day care and elder care are instrumental in the improvement in women's quality of life. This is true for both developed and developing countries. Old age security provided an important impetus for the initiation of the demographic transition, and continues to contribute to declining population growth rates. Freedom of choice for women, safe abortion, and safe contraception are critical. Safe contraceptive technologies do not

depend on forced reproductive technologies such as Depo-Provera. The Feminist International Network of Resistance to Reproductive and Genetic Engineering (FINRRAGE) has taken a strong stance against particular types of contraceptive technologies.

In 1990, Paul and Ann Ehrlich produced an update for the population bomb called *The Population Explosion*. In 1990, the world population had reached 5.3 billion people. Their argument is that population is the key to everything else. Today that statement is contested by a number of other critics. I understand that Joel Cohen is also among the people who say, "It is a very complex relationship, which includes culture and ethics, as well as simple reproductive forces."

Ehrlich and Ehrlich spoke here at Berkeley in 1994 and they discussed what would be the optimum population of human beings on the earth. The optimum population is a function of the quality of life. The minimal physical ingredients for a high quality of life for everybody are (a) biodiveristy, (b) basic human rights, and (c) large enough populations to foster and maintain cultural creativity and diversity. Cultural diversity throughout the globe is declining, as we become more globalized and incorporated into a single type of western style culture. The Ehrlichs argue that cultural diversity and biodiversity are both key elements in an optimum population size. The optimum global population, they argue, is 1.5 to 2 billion. Reducing the population to this level would entail a complete transformation from our current 6 billion-person population, or the projected levels of 8 to 12 billion people. We have not seen a global population of 2 billion since 1930.

Former World Bank economist, Herman Daly, proposes a vision of what the economy would look like in an optimum condition. Daly has written a number of books such as *Steady-State Economics, Economics, Ecology and Ethics,* and *For the Common Good.* Many mainstream economists view Daly with skepticism. However, I think he provides an important perspective on what our possibilities are. A steady state economy has a stable population, constant stocks of artifacts, and no or low growth in energy and materials. The steady state economy consumes low levels of matter and energy through conservation of nonrenewable resources and recycling. There is growth. The growth, however, would not be economic growth, but cultural growth and growth in the quality of life. The economy would be growing qualitatively instead of quantitatively. Economic services would be in a steady-state relationship with services provided by the ecosystem.

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Nations commission on environment and development. The United Nations Commission produced the book, "Our Common Future." This book was dedicated to the concept of sustainable development, which, to some people, is a contradiction in terms. The Bruntland Commission defined sustainable development as meeting the needs of the present generation without compromising the ability of future generations to meet their needs. Sustainable growth in developing countries has been prevented by the debt burdens of the third world countries and by international projects that have caused environmental destruction. Sustainable regenerative rather than chemically dependent agriculture, reforestation, watershed protection, small-scale agriculture, and low-cost sanitation were some of the projects that were proposed in "Our Common Future."

In the Netherlands, people put forward a proposal for a sustainable Netherlands. In 1998 the population of the Netherlands was 16 million and had a growth rate of 0.5. The population growth rate is currently projected to decrease to 0.1. The Dutch argued that production and consumption needed to be adjusted so that people could still live comfortably. In order to do that, products such as televisions, washing machines, radio, and automobiles needed to be more durable. They needed to focus on sustainable agricultural, which would yield greater production than does conventional agriculture. They argued that people could still have a high quality of life, but that they would need to reduce meat consumption by sixty to eighty percent. Timber use would have to drop by sixty percent, and water use would have to drop by thirty-two percent. These were projections for the year 2010. They also calculated sustainable energy use levels for the year 2010. A Dutch person would have the choice of traveling everyday either 15.5 miles by car, 31 miles a day by bus, 40 miles a day by train, or only 6.2 miles per day by plane. This means a Dutch person would be able to fly from Amsterdam to Rio de Janeiro only once every 20 years. By 2010, solar panels would produce twenty percent of all energy.

Campara, Australia has proposed a plan for a sustainable Campara. Their plan includes, for example, the installation of a light rail system, which would provide a comfortable, low air and low noise pollution alternative to the automobile.

What about natural resources? A sustainable world for the 21st century needs an approach to natural resource conservation. One possibility is eco-forestry, which is sometimes called sustainable forestry or community forestry. The goals of eco-forestry are beauty, health and permanence. Productivity would be a by-product of

these first goals. Forest products would include clean air, clean water and a sufficient supply of wood. Eco-forestry favors ends over means, and quality over quantity. The philosophy behind it emphasizes understanding the way ecosystem patterns work, interpreting what is happening ecologically, and making sound ecologically based decisions.

A plan for wildlife conservation will also need to be in place by the 21st century. This plan is already being formulated with the strategies of the IUCN, World Conservation Strategy. This strategy seeks to maintain, for all plant and animal species, the capacity for self-renewal, including climatic conditions, the water cycle, soils, and genetic diversity. This effort will only succeed with coordination and cooperation at the national and international levels.

Conservation biology is taught here at Berkeley, and the ideas of conservation biology emphasize, not just the large charismatic animals, but also the microorganisms and all the living things within ecosystems.

I would like to conclude with this idea: We need a new ethic for the future. We need an ethic that is based on a partnership between humans and the non-human community, in which there is exchange between them that promotes the greatest good for both cultural diversity and biodiversity. This includes social justice issues, minority issues, as well as population stabilization.