

## Isaac Asimov's Views on Over-population: Widely Ignored but Highly Relevant

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Few writers have addressed the problem of human over-population so perceptively as the late science popularizer and futurologist Isaac Asimov (1920–1992). His essays on the topic written and published 25–30 years ago are still relevant. The important things he has to say are: 1) over-population is threatening civilization; 2) there is an “ideal” or optimal size of human population, which we should strive for; 3) population is several times greater than it should be; 4) efforts to lessen poverty and otherwise improve quality of human life are being thwarted by over-population; 5) our best option is to limit population growth and reduce the present population; 6) intentional or planned population reduction can only be achieved if undertaken as a global goal of humanity; and 7) success in planned population reduction will be accompanied by benefits at every step of the way.

The first part of this commentary is an extensively revised and up-dated version of Asimov's “Letter to a newborn child”. Originally published in 1975 (*UNICEF News*, vol. 73, no. 1), it was reprinted in a collection of Asimov essays in 1983 and 1997 (*The Roving Mind*, Prometheus Books). Some new topics have been added to this revised version, and one or two that were a bit dated have been left out. A significant departure is that Asimov thought the earth's climate was getting colder, whereas we know now that it is getting warmer. Authorship of this new essay, “Letter to a child born in the year 2000” is mine, as is responsibility for any errors it might contain. My intellectual debt to Asimov will be evident to anyone who compares it to his original “Letter to a newborn child.”

Over-population raises profoundly disturbing issues about our relationships to the biosphere and the multitude of other earthly life forms. It calls into question our wisdom as a species and our collective ability to reign over the planet. It also poses fundamental questions about our human and biological natures. The second part of the essay attempts to answer at least some of these questions as they were answered or would have been answered by Asimov.

The organizations and individuals that should be most concerned about the population crisis—from UNICEF and the World Bank to Thailand's Alliance for the Poor and the journalists working for *Bangkok Post* and *The Nation*—have been ignoring the warnings of Isaac Asimov and others. They are failing even to discuss the problem of over-population, let alone to offer meaningful initiatives for planned population reduction.

### Letter to a Child Born in the Year 2000

Welcome, little child, to the six billion of us! That is how many members of our human species there are on our planet Earth—six billion.

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Six billion is a very large number. To help you realize just how large it really is, consider this: Ten is the number of fingers on your two baby hands. That is the number of persons in many families, perhaps in your family. If you live in a small village in the countryside, your village may number 100–1,000 people. More likely you live in a moderately large city with one hundred thousand to one million (100,000–1,000,000) people. One million is already a large number. If you live for 60 years, as I have, it would take your whole life just to meet each of these people, exchange a few words with them, and then say good-bye. In order to do this a million times, you would have to meet 100 people each and every day, spending only 2–3 minutes with each person (if you wish to have enough time for a reasonable night's sleep). But one million is a small number compared to one billion (1,000,000,000). Even if you live 60 years, and started from the day of your birth, you would only have enough time to see each person for just two seconds. And then you would see only 1/6 of the total number of people living in the year of your birth.

We have not always been six billion. Only 60 years ago, the year I was born, there were only about three billion people on the earth. Since then our population has doubled and it is still increasing. In the country in which I was born, the USA, there were only about 100 million people in 1940; now 280 million live there [the most precise available figure, as of 25 February 2001, is 283,685,194 residents; according to the U. S. Census Bureau Popclock website]. In Thailand, the much smaller country I have lived in for most of the last thirty years, the population increased from 25 million when I arrived in 1970 to 62 million in 2000.

More and more people are moving from the countryside, villages, towns, and smaller cities to large cities. The largest of our cities are now very big indeed, with more people than in many countries. Thus the chances are increasingly great that you were born in, or will move to live in, a "megalopolis" such as New York, Los Angeles, Tokyo, or Bangkok. These places are plagued by inadequate schools, health services, transportation, and housing. They produce enormous quantities of pollutants and have serious waste disposal problems. The difficulties confronting our largest cities are all aggravated by over-population, as much due to immigration as to high birth rates.

About 130 million people were born this year, and you were one of them. Of course, about 90 million people died this year. This means the world's human population increased by 40 million in just 12 months. By the time you are 60 years old, there could be over 9 billion people in the world—unless something happens to prevent the increase.

One thing that could happen is that the rate at which people die will increase. That might have started already. The vast numbers of mankind are causing our environment to decay. Enormous areas have been converted to agriculture, and wilderness has been destroyed to make room for herds and crops. The earth's non-renewable resources have been exploited relentlessly to provide energy, metals, fertilizers, and so forth to support our increasing numbers, with little or no regard for the impact this is having on our planet.

Thus far we have avoided a major catastrophe such as an all-out atomic war. To be sure, there have been many localized civil, ethnic and religious wars, some of them very nasty. The last time the whole world or much of it went to war was in the middle of the last century, and there were no atomic bombs until the very end of that war. Only two were exploded in anger, and only one country was able to use them. Now many countries have atomic bombs and the ability to explode them, but so far this has resulted in a sort of stalemate rather than outright hostilities. These atomic arsenals are very expensive to

maintain. Some of the atomic bombs have been stolen or sold and are now in the hands of terrorists or extortionists. No one knows how long this relative calm will last. Despite considerable reduction of its nuclear armaments, it is reported that Russia still has enough bombs "to totally destroy the United States."

The present situation, with the world full of strife, really should not be referred to as "calm". I was focusing on the menace from atomic war. But if we consider the life and death conflicts between people occurring in virtually every country, we can hardly describe the world as calm. Nearly all of this conflict involves too many people struggling for too few resources.

Some people say that humanity is better off on the average now than it was in the past, but not everyone agrees. One thing is sure, however: no matter how poverty is defined, there are more poor people today than there have ever been before, if only because there are so many more people in the world. Many people are concerned that our environment is being so badly damaged that the entire global ecosystem is in jeopardy. Many grown-ups should be concerned about this problem and trying to find ways to reduce our population numbers and also lessen our environmental impacts. This includes the leaders and representatives of national and supranational government agencies, development banks, and non-governmental organizations, and environmental journalists. But they seem unwilling or unable to acknowledge the problem, let alone deal with it. Perhaps they are in a state of denial, awed by the magnitude of the problem. They may be afraid to recognize the problem because they don't know how to deal with it, or they no longer believe that it can be dealt with, or they just do not want to face up to it.

For many years there has been an energy problem and it is getting worse. This energy problem, which used to be called an energy crisis, is more complicated than we thought. There are really enormous amounts of energy available, more than humanity could ever utilize on this earth for any conceivable purpose. Most of these energy sources have never been tapped and some of them probably have not yet even been identified. No, the problem is rather that some of the sources of energy that have been tapped are not environmentally friendly. Consequently we have polluted and otherwise damaged our forests, lands, lakes, rivers, coastal areas and oceans, even the very air that we breathe, even the rarified air in the upper atmosphere that we do not breathe, but which is vital to the health of the planet Earth.

All of the combustible energy sources we have been using—and this includes natural gas as well as coal and petroleum—generate waste products and heat. Some of these waste products can be cleaned up or avoided, but the problem of waste disposal gets bigger and bigger every year with increasing population. And there might not be any solution to the worst problem with energy, that is, its degradation from whatever form it is in when we use it to heat when we are through using it.

Earth's climate is getting warmer. Even those experts who study weather and climate do not agree on why it is getting warmer, and so we do not know (or at least we cannot agree upon) what to do about it. The important thing is that the change will be disastrous for humanity on a scale much larger than we have previously experienced. This year, the year of your birth, storms of unprecedented magnitude and duration caused widespread flooding in the most populous areas in Asia, including Bangladesh, West Bengal and other parts of India; the Mekong basin, including Thailand, Cambodia, and Vietnam; and even in Japan, the Philippines, and Sri Lanka. These storms are surely harbingers of worse to

come. The leaders and representatives that I spoke of are calling the floods a “natural disaster” due mainly to global warming and increased rainfall. Leaving aside the question of whether mankind is primarily responsible for global warming, people who have looked more closely into the cause of these floods have pointed to the undeniable contribution of human factors. They note the steady loss of forest cover due to cutting trees—to meet mankind’s insatiable demand for timber and other wood products; and to releases of large volumes of water from dams that were saving the water to generate electricity—to satisfy mankind’s insatiable demands for energy.

Global warming is striking at the very basis of our civilization in other alarming ways. Our earth is a watery planet, three-quarters of its surface covered by oceans. The level of the oceans changes gradually with time. During the Ice Ages, when the earth has been colder, the level has actually dropped. This is because fairly large amounts of water are changed from liquid water to solid water or ice. The ice accumulates in the coldest parts of the globe: the highest mountains (including the Andes of South America and the Himalayas in Asia), the extreme northern and southern ends of continents, and in the Arctic and Antarctic polar ice caps. The two largest concentrations of ice are on the island of Greenland and the South polar continent Antarctica. In all of these places the ice is melting, and therefore the sea level is rising. This has been going on for at least 30–40 years, perhaps longer. It probably started slowly, but the really scary thing is that the process seems to be accelerating.

If you were one of the many hundreds of millions of the earth’s children born in one of the heavily populated lowland areas, such as the Mekong delta or Bangladesh, the place where you live may be under water by the time you are 35 years old. Even if the land is not under water, it may be spoiled for agriculture by salt water incursion. Rice and other food grains stored to feed you and countless other millions in case of calamity or minor scarcity may be largely destroyed by fungus and other pests that have flourished under the increasing temperature and humidity. Nor will this be the only negative impact on food supply.

Our increasingly large cities, highways, and other infrastructure are occupying more and more of the best farmland, thus contributing to the development of farms in areas with less productive soil. Much of this land used to be covered by forests that protected the watersheds of great rivers such as the Ganges-Brahmaputra, Mekong, and Yangtze, and incidentally provided habitats for many of the earth’s plant and animal species.

In addition to widespread lack of food security, insufficient clean drinking water, and air pollution, and partly because of these problems, there has been an alarming increase in the incidence of diseases, again especially in parts of the world with the largest and poorest populations. Smallpox apparently has been conquered for good, but malaria is back in strength and is killing more people than ever. New and threatening diseases have appeared only in the last few years, including AIDS and Ebola. Both of these diseases were spreading in the population in Zaire and other central African countries while that region was engaged in brutal civil wars and the world’s attention was diverted elsewhere. Now even the most peaceful countries in Africa, such as Uganda, are threatened by outbreaks of both diseases. In just a few decades AIDS spread from Africa to around the world. Ebola, so far, is confined to Africa, but who knows for how much longer? Thailand, the country in which I live, has a longstanding problem with AIDS and is now threatened with new (or newly noticed) diseases such as dengue fever and leptospirosis.

The nations that have suffered the most up to now, and that will suffer even more as you grow up, are those that are poor and already near starvation or actually experiencing it—and it is in these countries that population is increasing most rapidly. The chances are about 9 out of 10 that you were born in a poor nation—such as Bangladesh, India, or China, Nigeria, Tanzania or Kenya, Paraguay, or Haiti. That means that you probably won't be able to read this letter, because you will be illiterate. If you do read it or have it read to you, you probably don't have enough education to understand very much of what I am trying to tell you. You probably won't have heard the names of many of the countries mentioned, and you won't even know much about the country in which you were born. Your chances of living past childhood are not nearly so good as they should be. If you do survive childhood, you may find that you get enough food to stay alive, but not enough to be healthy, happy and wise.

And in the mad scramble for food on your part and on the part of billions of others, the people of Earth will further damage the world they live in, and will fight each other over scraps. As things grow worse, the death rate will go very high. When this happens, one government after another will fail, or groups of governments may fail at once, and all of civilization may crash. Then if you do reach middle age, you may find you are living in a savage world in which you and a few millions of others are living among the vast ruins of a much richer and more comfortable age.

Isn't there anything that can be done to ward off this decline? Well, if we don't want to see population rapidly reduced by famine, disease, war, or a combination of these, the only alternative is for people to have fewer children. In a few places wise young adults are voluntarily cutting down their own birth rates. They are doing it because they feel it is in their own best interests as well as in the interests of the fewer children they do have, and of their children's children. There are still far too many countries with high birth rates, and not nearly enough with birth rates going down. My hope for you and for the rest of mankind is that before you are grown up—even perhaps before I die—many countries will have declining birth rates. The benefits of reducing the population will accrue at every step of the way, as will your chances of living to a jolly ripe old age in a world well fed and at peace.

The world is not in a happy state in the year of your birth. Perhaps you and those born along with you will leave it better than you found it, or at least no worse off. It might be a better world eventually, if not for you, then for your children.

Wisely handled, present and future technology can be used to prevent and reverse pollution, develop new and environmentally more friendly and less polluting energy sources, preserve the beauty and abundance of nature, and the cleanliness and purity of soil, air and water. We can learn to conserve the limited renewable resources of the world, eliminate our dependence on non-renewable resources (including rivers) and distribute what we have more fairly so that people can live healthier, more productive and more enjoyable lives. We might then at least feel more trusting and kindlier towards one another. In a happier world, people might be less inclined to amass wealth because they feel threatened, the diversity of plants and animals might be conserved to the wonderment and benefit of all, local conflicts would diminish greatly, and the threat of local wars and nuclear holocaust might disappear.

You are small and defenseless, adorable, and charming, as are all newborn children. You deserve a bright, happy, interesting and peaceful life, and a good education. You also

deserve a mate to share your happiness as well as the trials and tribulations that are the inevitable lot of every human being. This is your birthright, and I hope it will be your fate. Welcome to the planet. It really is a lovely place.

### **Questions Raised by Over-population and Population Reduction**

*What is the ideal or optimal size of the total human population on earth?* To begin to answer this question, we must first agree on some standard. Note that the question refers to the “ideal” or “optimal” population. One standard is “as many people as the earth can support and still be user-friendly”. Unfortunately we do not know enough about the biosphere and how it functions to be able to determine this. Another standard is the number of people the earth could support if each individual was to enjoy a standard of living equivalent to that of an average citizen of the United States. The actual number will of course depend to some extent on the level of agricultural and other technology. Given our present technology, there are perhaps five to ten times more people than there should be. In 1975, when the global human population was about four billion, Asimov suggested that the earth could support only a half billion (500,000,000) people at the average life style of a US citizen. With technological advances, that number might be increased to one billion by the year 2020.

*Why can't we increase the number of people and increase quality of life too?* A Muslim graduate student in chemistry at the Malaysian University of Science in Penang asked me this question. I suppose that if Allah wills it, both things are possible. But what if Allah does not will it? For people such as the Pope, Commander in Chief of the Catholic faithful, who see absolute good in absolute numbers, the more people the better. After all, the more people there are, the more souls there will be to be saved. To which we may add, the more people there are the more suffering there will be, and therefore the more people whose only hope will lie in “salvation” (whatever that is). China's great communist leader Mao Tse Tung also believed the more people the better, because more people mean more pressure for revolution and social change—and in that he was certainly right. Summarizing this discussion, we see that it is possible to maximize (or optimize, if you happen to think like Mao or the Pope) the attributes of more population, more suffering, more social pressure, and more souls to be saved. It is possible to maximize all of these conditions at the same time because they are mutually dependent and because—in the context of the thinking of Mao and the Pope—they are not subject to ecological or environmental limiting factors. Neither Mao nor the Pope is known for particularly thoughtful approaches to ecology or the environment. Quantity and quality of human life cannot be maximized at the same time because too many people use up too many resources, produce too much pollution, and create conditions that increase poverty and disease, social inequality, and alienation—all of which detract from quality of life (no matter how defined).

*Any slowing down or decrease in the rate of human population growth will have disastrous consequences for the economy. Our civilization is based on continually expanding economy and population growth. Without more people, there will not be a continually increasing supply of laborers and consumers. If population declines, markets will decline.* The proposition is true only if we continue in the same misguided development paradigm based

on continued population growth with its attendant problems of non-sustainability. Market decline due to fewer people can be more than off-set by improving market participation of the entire population. A recent report by the World Bank concluded that half of the world's population, or 3 billion people, lived on only US \$2 a day. Imagine the increase in the market if these people's daily income was increased to \$10 or \$20.

*Women's natural role in life is bearing and raising children. Throughout human existence women have typically borne 2–3 or more children. Without caring for children, raising them, and seeing that they get an education, women's lives will be empty and meaningless.* This is essentially a quality of life issue. Asimov's response to it is that women should have every opportunity available in their lives that men have in theirs, so that they can freely chose the kind of life they want to have. Women's role needs redefinition. What was appropriate and healthy reproductive behavior in the distant past, when humans were relatively few in number and their technology was relatively rudimentary, is now inappropriate and unhealthy. Women should opt for a better quality of life for themselves and for the children they do have. Woman should strive to be "as much as they can be". They and their children need better education, better health services; they need a healthier and saner environment in which to live, free of pollution, corruption, and alienation.

*In a future society with reduced birth rates, and very likely reduced death rates, the relative proportion of old to young and middle-aged people is likely to be greater than it has ever been in the history of our species. This will create insurmountable social and economic problems.* This really is a question of quality of life, as it applies to the largest constituency of human beings. That is, so long as we live, we all have a vested interest in the welfare of older citizens, and in making sure that it is provided for, so that they can live comfortable and happily in their old age. Older citizens, as the repository of culture and wisdom, have a vitally important role to fulfill in future society. Helping them fulfill this role should be one of the objectives of any concerted effort to improve the quality of life. A big step in this direction would be to recognize that people are never too old to be educated or to teach, and that education throughout life is a worthwhile goal, indeed a necessary goal of society.

*Population reduction is a First World or elitist concept, hence irrelevant to Third World countries and poor people. It is aimed at benefiting the rich. Poor people cannot afford to have fewer babies. If they don't have children who will care for them in their old age?* Global population reduction will benefit rich people living in the First World. It will benefit all people everywhere, and particularly poor people in the Third World. Planned or intentional population reduction is an elitist concept in which all human beings are members of the elite. It is integrally linked to our efforts to achieve realistic economic growth and better quality of life for all. It can only succeed if adopted as a global goal to which all of humanity is committed. The belief that children of poor people support their parents is wishful thinking. Most children of poor parents are unable to provide for themselves and their own children and they cannot also provide for their parents. The best hope for the poor is that society will be able to increase the level of income and improve the standard of living. This can only happen if population is reduced.

### Discussion

Isaac Asimov promoted a world in which humans, science, and technology ruled supreme. He saw clearly that over-population is a serious obstacle to such an achievement. He also saw that it would be impossible for our species to emphasize quality of life and at the same time expand human population indefinitely. Like nearly all scientists and futurologists concerned with over-population, he foresaw population limited by resources. Thomas Malthus saw human population limited by the ability of agriculture to produce food; the Club of Rome civilization limited by shortage of critical natural resources; Asimov human civilization limited by energy shortages. All such forecasts have proven premature.

In one crucial area Asimov, like most of his predecessors and contemporaries, did not foresee the most frightening possible consequences of over-population. He did not recognize the possibility of global ecosystem simplification or decay which could result in a very sudden catastrophic collapse of civilization and population. A plethora of recent archaeological studies from all over the world hint, suggest or confirm that civilizations suddenly disappeared due to catastrophic collapse of their supporting ecosystem. Largely as a consequence of environmental impact assessment for large development projects (including but not limited to hydropower and irrigation dams, large-scale mining operations, and atomic power plants) we know much more about the possibility or likelihood of sudden ecosystem collapse. We know enough to realize that we may be approaching such a disaster on a global scale, that its exact form may remain unknown until its occurrence, and that once it starts to happen, it is likely to be irreversible. This means that by the time the problem is recognized it will be too late to do much about it. Such a collapse, while it may not cause extinction of our species, is sure to result in fewer people with simpler life styles and reduced quality of life.

### Conclusion

Thailand's two English language newspapers, *Bangkok Post* and *The Nation*, have recently been dominated by coverage of environmental issues, including disastrous floods in Cambodia and Vietnam, Bengal, and Bangladesh. There has been a great deal of coverage of Pak Mun dam, the social and environmental ramifications of which seemingly have implications in every aspect of the national life. They have published statements by international and regional organizations, governmental agencies, and NGOs (non-governmental organizations) addressing social and environmental issues, including poverty, drug abuse, disease, housing, unemployment, deforestation, and global warming. There have been many articles on what to do about poverty by spokespersons for ADB (Asian Development Bank), ASEAN (Association of Southeast Asian Nations), Assembly for the Poor (a Thai NGO), ESCAP, UNDP, WHO, and the World Council of Churches. Over-population is almost never mentioned, let alone discussed openly and honestly. Why this conspiracy of silence?

Mr. Jayashankar Shivakumar, Country Director of the World Bank in Thailand, was widely reported in *Bangkok Post* and *The Nation* from 14 Sept. – 24 Oct. 2000 for his views on reducing poverty, the state of the Thai economy, and the roots of the Pak Mun dam controversy. Shivakumar advises the incoming Thai Prime Minister “to think big”, on



poverty, the economy, and other issues. His thoughtful remarks are vitiated by the total absence of any reference to the problem of over-population, let alone of his thinking or suggestions on how to deal with it.

UNICEF is probably the most important organization in the world when it comes to influential organizations promoting the welfare of children. In 1989, 15 years after Asimov's letter was published in the UNICEF Newsletter, UNICEF issued the "Convention on the Rights of the Child." More recently it has been stressing the pressing need to care of children during the formative and critical first three years of life (*Bangkok Post*, 16 Dec. 2000). This and other issues of concern to UNICEF and everyone who care about our children and our future are openly presented in the user-friendly UNICEF web-site. The first right of a child is the right to life. But how about the right to be born into a world that is not over-populated? The topic of over-population evidently is taboo. Aren't UNICEF people aware of the problem? Perhaps the topic is too contentious, too potentially divisive for UNICEF to handle. Perhaps they fear that UNICEF will become unpopular if it dares mention over-population and planned population reduction. In that case, however, all of their declarations, comments and discussion of the Rights of the Child ring hollow.

Virtually all inhabitable tropical islands are over-populated. Fiji has too many Indians and too many Fijians, New Caledonia too many Kanakas, too many French, and too many Kanaka and French nickel miners polluting New Caledonia's magnificent coral reefs and lagoons. Other islands with too many people include Hawaii and Madagascar.

Indonesia has far too many people. The Suharto policy of *transmigrasi* (transmigration), involving resettlement of people mainly from the over-populated islands of Java and Madura into less over-populated islands including Sumatra, Sulawesi, and Borneo, has been an unmitigated social and environmental disaster. It is directly linked to the terrible forest fires that have devastated rain forests in Borneo and Sumatra for many years, and to the riots and murder of immigrants by local people throughout much of the island archipelago.

Between 1970 and 1990 Thailand's population exploded from 25 million to 59 million. The resulting over-population has aggravated virtually every social and environmental problem facing the country today.

Cambodia, a small country with over 11 million people now, has numerous representatives of numerous international and non-governmental agencies. Very few if any of these specialized aid workers and advisors are concerned about the fact that Cambodia is in the early stage of a population explosion comparable that of Thailand in the 1960's.

Bangladesh, India, and Vietnam have far too many people living on flood plains, and there are too many people living on low islands scattered in the Indian Ocean and the Pacific and elsewhere, even if there was no rise in sea level due to global warming.

And there are too many rich people in countries all over the world consuming natural resources and polluting the environment.

The World Bank's Mr Shivakumar, and representatives of the Assembly for the Poor, Asian Development Bank, and many other organizations and agencies should start to think big about how to achieve planned population reduction. If they need inspiration or ideas, they would do well to read some essays by Isaac Asimov.

