

The planet is booming – literally. ● Population is rising and cities are relentlessly increasing in size. ● For the first time in human history, the urban population is larger than the rural one. ● But as the planet grows, resources thin out. ● Moreover, the world’s population is aging and global warming remains a troubling specter. ● Some warn of ‘a perfect storm’ of woe in 2030. ● What can be done? ●

# Nine Billion Challenges

compiled and written by Donato Speroni

According to data from the United Nations, by the year 2050 the planet will house some nine billion people. These new inhabitants are destined to alter geography of the global population. Of the 2.3 billion new people, most will swell the ranks of developing countries, with its numbers rising from 5.6 billion in 2009 to 7.9 billion. Moreover, the forecast 2.3 percent annual population growth is expected to take place mostly in the 49 less developed countries. Even if economic growth rates should decrease significantly in the coming decades, the population of poorer states is still expected to double from .84 billion in 2009 to 1.7 billion in 2050.

But what exactly will that signify in political, economic, social terms?

The leaders of 2050 won’t be this generation’s great-grandchildren, but its children, and they’re likely to be dealing with a weary and overcrowded planet. Half of the world population alive today will still be living in 2050. Yet the evolution of social and environmental problems, flanked by swift increases technological opportunities, make it difficult to image what the world will look like 40 years from now. New prediction techniques are required, says Enrico Giovannini, who heads Italy’s state statistical institute, ISTAT.

If there’s one field in which today’s forecasts seem credible it’s demographics. Global fertility rates change slowly and the effects are drawn out over decades. Putting aside catastrophic prospects, such as asteroids and pandemics, estimating the population in 2050 is within the grasp of today’s statisticians. An end-of-August look at the “Population clock” on the homepage of Census, the central statistical office of the United States, saw the world’s population at 6.865 billion, with 150 new births per minute. The United Nations updates its projections biennially. With fertility levels in decline, the UN wrote in its last report, in 2008, the body estimated that world population would reach 9.1 billion in 2050, “based on assumptions of intermediate growth.”

What about later? While demographers agree in broad terms about the rise in global population through the first half-century, estimates for the second half of the 21<sup>st</sup> century are less precise. Many nations will be close to or below population maintenance limits, equal to 2.1 children per woman. Based on this assessment, population growth should stabilize, with the total unlikely to exceed 10 billion.

If the inhabitants of the poorest countries are expected to double, the population of more developed regions will likely post a minimal change, moving from 1.23 billion to 1.28 billion. The figure would actually decrease if it weren’t for the ongoing migration from developing to developed countries.

What kinds of consequences will these demographic imbalances produce, particularly in environmental terms? Of the many question marks, the first concerns the actual number of migrants. In the interview published in

this special report, Italian demographer Antonio Golini says the UN’s projection of net south-to-north migration of 2.5 million people annually (which would signify a mere 100 million over 40 years) is unrealistically low.

Alarm bells are going off across the board. A recent Princeton University study predicted that for every 10 percent of agricultural land that Mexico loses to climate change, there would be a two percent northward population, with residents edging into the U.S. and Canada.

It’s easy to imagine the pattern developing in terms of Africa and Europe. A “cautionary” Youtube video posted by a fundamentalist Christian group documents the rapid growth of Muslim population in Europe and the Americas. The video represents a backhanded way of

Ghostly slums on the outskirts of Manila contrast with the city’s modern skyline.



recommending a new evangelical campaign directed at immigrants. But the site focuses on a recent remark by Libyan leader Muammar Gaddafi in which he says fighting Europe in military or terrorist terms makes no sense in the long run. Islamization, he suggests, amounts to waiting game, as immigrant families grow and ultimately surpass the local population numbers. Gaddafi repeated his viewpoint in a late August visit to Rome, telling young women that that Islam was the “ultimate religion,” and insisting, “if you want to believe in a single faith then it must be that of Mohammed.”

A side from religious and cultural issues, increased immigration could actually benefit industrialized countries, as new workers reduce the burden of an aging population and keep social welfare systems from collapsing into bankruptcy. But beware: powerful as force as it is, migration alone is no solution for the troubled economies



of developing states, which still need to strengthen their local structures. The working age population, aged 15 to 65 years, is expected to increase by 1.7 billion people, covering many states and territories. The figure is expected to drop by 92 million in developed countries, while increasing by 708 million in developing nations and by 1.067 billion in emerging nations. “What this means,” writes Golini in his book, “Il futuro della popolazione nel mondo” (“The Future of the Global Population”), “is that developing countries will need to create 1.25 billion new jobs to cope with demographic shifts.” And this will not be enough, because other jobs will be needed as a consequence of the broad-based modernization of agricultural methods (which siphons millions of workers) and of the advances for women, who represent a growing contingent in the cheap labor market.

In short, the creation of 1.5 to 2 billion new and “decent” jobs is essential, to use the phrase favored by the International Labor Organization. Not only decent jobs,

but jobs that also assure workers of a decent income. To get an idea of the task at hand, it’s worth bearing in mind that the wealthier northern countries currently employ approximately 550 to 600 million people.

**T**hen there’s the matter of aging. The future population will not only differentiate itself in terms of its territorial distribution, but also based on age structure. The UN report notes that over-60 population is growing faster. In more developed regions its numbers are increasing at a rate of two percent annually, with the number in developing countries pegged at three percent.

This pattern of progressive aging also creates delicate economic problems as well as transforming social behavior. The social systems of industrialized countries are imperiled by pension-plan costs and meeting increased demand for health care, both exacerbated by lengthened life spans. But the problems are also having an impact on some emerging economies. China is beginning to worry

about coming drops in its 15-to-29 age group, considered the most likely to migrate from the interior to the booming coastline, bringing cheap labor with it. Writes “The Economist”: “After increasing systematically over the past decade, the number of Chinese aged 15- to-29 will begin to decline beginning in 2011. The drop is already evident in university enrollment, which has dropped for two consecutive years.”

As the elderly began to constitute too large a number

FACING PAGE Indian students part of the Wealth Out of Waste (WOW) program celebrate India’s National Recycling Day last July. The Indian population is growing at a 2.21 percent annual rate and produces 532 million cubic meters of garbage each year. WOW was started by ITC Paperboards and the Ramky Group, which say they want to introduce recyclable materials to produce cheap goods and minimize harmful effects on the environment. BELOW A demonstration held by Muslims in Trafalgar Square.



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for modern society to cope with, attitude towards them are also in flux. The reverence heaped on elders as respected custodians of the traditions of family heritage are falling away. Many are beginning to consider them a nuisance, even in traditional societies such as Japan. Western media recently reported Japanese reports about the breakdown in intergenerational cohesion. In some cases, at least according to Japanese papers, some busy urban children didn’t even know if their parents, some of them by now centenarians, were dead or alive. Even Prime Minister Naoto Kan weighed in, telling parliament: “I assume this is due to the fact that human bonds are weakening. Society as a whole is tending to break down human relationships.”

Even the traditional relationship between city and countryside is in profound flux. In 2008, for the first time in human history, more people were living in cities than in the countryside, according to data released by the UNFPA, the United Nations Population Fund. “The number and proportion of city-dwellers will continue to grow rapidly,” said the agency’s 2007 State of the World Population report, which focuses on issues of urbanization.

It predicted that by 2030 the urban population would rise to 4.9 billion, while the rural population would decrease by 28 million between 2005 and 2030. UNFPA added that all future population growth would be likely to occur in cities, mostly in developing countries, while the urban population of the industrialized world was expected to grow from 870 million to one billion.

**O**verall, said the report, the urban population “will double between 2000 and 2030 in Africa and Asia. That is, the accumulated urban growth of these two regions during the whole span of history will be duplicated in a single generation. By 2030, the towns and cities of the developing world will make up 81 per cent of urban humanity.” It predicted slower growth in Latin America and the Caribbean.

The emptying out of the global countryside has always been seen as potential dilemma, particularly in developing countries. A rural family that works in subsistence conditions depends on a network of solidarity guaranteed by a village or clan. Such a family transported to a city finds itself in totally different circumstances, de-



pendent on external conditions to find a job and meet its daily needs.

Regarding child labor, an unfortunately common practice in poorer countries, major differences emerge in rural and city contexts. It's one thing to see girls or boys assisting their parents in tilling fields or with domestic chores (often in situations where schools are non-existent), quite another to witness the organization of street gangs that prowl through slum refuse and become involved in the commission of petty crimes.

Defending rural life clashes with two harsh realities. The first is the allure of the city, albeit illusory. It seems to offer a more attractive lifestyle, with benefits that are hard to imagine in a rural network. Second, sheer numbers are making village life all but impossible. If the population increases in concert with deteriorating agricultural conditions as a result of climate change, rural existence is brought to a standstill. While city survival seems possible, village life isn't.

The inexorable trend toward urbanization doesn't mean that formal rural dwellers should be confined to the slums of mega-cities. In the coming years, smaller cities with less than 500,000 inhabitants are expected to absorb about half of urban growth. It's far from a sure thing that mega-cities alone will represent the prevailing urban model of the future. "At the moment," said the UNFPA report, "many of the world's largest cities, such as Buenos Aires, Calcutta, Mexico City, Sao Paulo and Seoul, are seeing more departures than arrivals. Few of these cities have reached the catastrophic sizes predicated in by demographers in the 1970s."

At the same time, even intermediate-sized cities have their problems. In some of them, growth is almost incalculable. Take for example Gaborone, the capital of Botswana. The city, which had some 18,000 inhabitants in the 1970s, is forecast to have a population of more than 500,000 inhabitants by 2020. It's like an Italian village turning into a city the size Genoa and Palermo over 50 years. Botswana is a relatively rich thanks to diamond mining and is sometimes referred to as the Switzerland of Africa because of its sound administrative practices. "Gaborone is fortunate compared to other small cities," writes UNFPA, "but at the same time it faces indiscriminate low density territorial expansion, exceedingly high

unemployment rates, a poverty rate in excess of 47 percent, a proliferation of off-the-books work, high HIV/AIDS rates, inadequate infrastructure, urban segregation, and inadequate water and sanitation facilities. "In short, writes UNFPA, "the role of smaller cities in absorbing urban growth is both source of hope and concern."

The new demographics have also unleashed considerable controversy. Creating a "decent" life for more than nine billion human beings requires a complex system of resource management. Based on existing technology and whatever comes into use in late decades, it will demand an enormous commitment in terms of water, energy, food and natural resources.

There's also the risk of the new population boom coinciding with global warming forecasts. These much-debated forecasts have also caused institutional ripples. When the Intergovernmental Panel on Climate Change (IPCC), inaccurately suggested that the Himalayan glaciers could disappear by 2035, its president, Rajendra Pachauri, came under pressure to resign. Despite the back-and-forth debate, the prospect of global warming is gaining adherents. Even "skeptical environmentalist" Bjorn Lomborg said he'd recently come around to believing that the phenomenon was real.

Some think that they can change the situation by literally leaning on demographics, through campaigns to attempt voluntary reduce birth rates in developing countries (with strong resistance by the Catholic church) or redressing imbalances (through an emphasis on child-bearing) in developed ones. It's unquestionable that the Roman Catholic Church's (and other churches) systematic resistance to birth control has helped accelerate the population explosion. But the long-term trends transcend religious beliefs.

**T**he debate between Fred Pearce and Robert Walker outlined on these pages reflects the extent to which the subject is a lightning rod for viewpoints. Information regarding birth control is essential in order to satisfy the growing demand for contraception methods by women, but it has a marginal impact on the overall numbers. Similarly, while policy efforts designed to increase the birth rate in industrialized countries may respond to cultural needs (defense against an excessive



Alp / Getty Images / T. Aljibe

influx of migrants, for example) or the revival of the traditional family unit, these kinds of plans are unlikely to have much impact on global configurations.

But if the underlying population boom trend is in fact a reality, what exactly does that mean for planetary life in the coming decades? John Beddington, the British government's chief scientific advisor, recently warned of a "perfect storm" that might plunge the planet into chaos by 2030. His scenario suggested food shortages, scarce water and insufficient energy resources, which could unleash public unrest, cross-border conflicts and mass migration as people flee from the worst-affected regions. Based on this forecast, the authoritative Population Institute in June circulated a pamphlet (republished nearly in full on these pages) intended to raise consciousness.

The validity of Beddington's predictions can be debated, but, as Giovannini notes, there's no alternative model as to how society as we know it can survive if the worst-case scenario does come to pass. There's day-

New mothers and their infant children. Between 2010 and 2030 the urban population is expected to double in Africa and Asia and also grow in Latin America and the Caribbean.

dreaming, which included the near-mythic creation of nuclear fusion that will furnish the planet with cheap and copious amounts of non-polluting energy, solving the world's water and food problems. Futurist Raymond Kurzweil has predicted that a new supercomputer capable of exceeding human intelligence will ultimately solve the problems that man today tries sweeping under the carpet. But no one suggests these miracles can be set in motion before the year of the perfect storm. The "Prosperity Without Growth" report commissioned by the British government and released in March 2009 was chastening. "The truth is that there is still no credible scenario, either socially just or economically viable, for a world of nine billion people."

# Giovannini: Changing the Approach

Enrico Giovannini, who heads the Italian statistical bureau ISTAT, worries that the measuring of global sustainability has received short shrift as world governments focus on environmental issues alone. Working toward global sustainability requires admitting that problems perceived as marginal today could become crippling over decades. He seeks the creation of climate-change style bodies to support with adequate social knowledge the political choices that help the planet's booming citizenry.



Xinhua Press / Corbis / S. Hong

It's not often that the head Italy's statistical institute ISTAT leans toward recommending "revolutionary" theories. But Enrico Giovannini, atop the Italian body for a year following a decade as head of the statistical office of the Organization for European Economic Cooperation (OECD), has the courage of his convictions. He insists that unless new and more comprehensive statistical models are applied to planet's trends, the assessment of ongoing global population changes and overall levels of sustainability will yield only partial and potentially unsatisfactory answers. Relying on general indicators to suggest what the world will look like for future generations is no longer enough, he adds. Risk ratings must be introduced to probe the effectiveness of current policy choice and to work to avert the possibility collapses on a local and global level in the coming years and decades.

Giovannini has worked with American economist Joseph Stiglitz (see "east" 27) to help develop new human welfare indicators as part of a project commissioned by French President Nicolas Sarkozy. He chatted with "east" about the challenges faced by global statisticians in a fast-evolving world.

**We're moving toward a planet that will have a population of nine billion people. Given those numbers, how can sustainability be properly defined?**

In 1987, the Brundtland Commission report titled "Our Common Future" explained it in terms of one generation's ability to meet its own needs without hindering a future generation from making the same effort. It's an inherently intergenerational concept, to try to pass down a sufficient amount of capital to future generations so that they, too, can enjoy adequate goods and services.

**What does the word "capital" mean in this context?**

Thanks to international studies, we've been able to break down capital into the following categories: Physical capital, which is somehow linked to economic activity (material goods, computers, cars, homes, and so on.)

Natural resources, which consist of what the environment has to offer.

United Nations Secretary-General Ban Ki-moon and American actor Edward Norton introducing the International Biodiversity Year t-shirt.

Human capital, which includes not only population's numbers, but also knowledge and available skills to manage technology. Social capital, which means ties between individuals and society.

**We know physical capital is measurable.**

**We have statistical data about GDP but also NDP, which takes into consideration the depreciation of capital goods. But how do you measure the other kinds of capital?**

We know how to measure physical capital in concrete terms. Problems arise when we try to price the other kinds of capital to in an effort to assess specific monetary values to be added or subtracted from GDP.

**I presume the reason for that, at least in part, is that we can't, to take an example, quantify the economic impact of a ton of carbon dioxide released into atmosphere in monetary terms.**

Thanks to Kyoto mechanisms there's a CO<sub>2</sub> emissions market, and we actually can calculate those costs. The same is true for oil: we don't know how long oil resources will last, but at least we have a price. The biggest problem in terms of an assessment arises when we consider resources that we are not able to quantify in monetary terms. Take biodiversity. What's the price, marginal or otherwise, of the loss of a certain species of butterfly?

**What about defining human capital?**

A great deal of progress has been made in attempting to measure it, both in financial terms and absolute ones. Consider for example the OECD's PISA study (Programme for International Student Assessment), which evaluates the scholastic performance of 15-year-olds. That will be supplemented by PIAAC (Programme for the Assessment of Adult Competencies), which is designed to measure skills in the 50 year old population. In short, we can calculate the monetary return of an additional year of education and how it might translate into productivity in various contexts.

**Measuring social capital must present a different set of challenges.**

It does. Economists don't agree on how to read it. They concur regarding its overall importance, but not regarding the ways of measuring its accumulation or "decumulation" over time. Still, social cohesion is a key element in any discussion of sustainability. The difficulties in transforming these measurements into monetary values

suggests that it's not really very useful to have any single measure for the various kinds of capital. Instead, it requires a full set of indicators. Those who have tried applying a single indicator, the World Bank for example, have calculated adjusted net savings (capital accumulation corrected to reflect sustainability) and have emerged with some interesting results. But since the results themselves are based on some very questionable assumptions, it's hard to consider them useful.

**Overall, can you say there's international movement toward an agreed-upon set of indicators? The Stiglitz Commission stressed the difficulty of finding a measurement system that covers sustainability, despite the existing indicators.**

In 2011, the UN, the OECD and the Unece, the UN economic commission for Europe, will review the situation, with particular attention to social capital. We hope that represents a starting point toward building a consensus. With the Stiglitz report, we tried to make it clear that using statistics alone isn't enough to assess sustainability. You need data but you also need models. Statistics, as a measure of past and present phenomena, can't by themselves tell us if the future situation will be sustainable.

**Does that mean what we have now is essentially useless?**

No, just that the road ahead of us is still a long one. For example, Brundtland Commission, in addition to planting an economic, environmental and social pillar, planted a fourth one, but didn't get into it in detail. That fourth one was governance. Since the 1992 Rio de Janeiro summit, the environment and the economy have been bound together quite successfully when it comes to concepts of sustainability. Perhaps too much so, since social problems are often ignored in the process. In many countries, discussion regarding human sustainability often revolves only around sustaining the environment.

**Why is it so hard to measure social sustainability?**

We can presume to know the conditions of sustainability in any given economic system, based on public and private debt. When it comes to the environment it's a matter of estimating thresholds (pollution, for example.) In effect, we know the limits beyond which we can't go. There are points of no return. On the social side, there is no such "theory of revolution."

**What do you mean?**

We don't have a functioning theory of social systems



that can tell us, for example, that after a certain level of unemployment a revolution is likely to break out. The concept of sustainability in social terms is much less defined than it is on the economic side. The OECD tried years ago to measure social sustainability in terms of the sustainability of social institutions that specifically address social issues, such as pensions, education and health. It was an interesting effort, albeit a simplistic one. More to the point, it just didn't work.

As a result, the understanding of social sustainability had been systematically put aside, at least in terms of defining it factually. Yet it still has a major impact on how a society is put together and operates.

**In short, we're not able to create tolerance threshold for those that exist in disadvantaged social situations in different national settings.**

Precisely. And this makes any discussion about sustainability incomplete or potentially misleading. I worry that in two or three decades, when we and our children get first-hand experience regarding the shortfalls of our models of sustainability we'll kick ourselves for having insisted on its limitations.

If sustainability means that my behavior today will affect future generations, I will worry only if I have an altruistic attitude. But if instead we think in "dual" terms, that paradigm is reversed. Time stands still and we talk only about existing vulnerabilities and threats of today. That in turn changes everything because the matter at hand becomes selfish. It has to do with my present, my state of affairs, my affluence. For example, if I win the lottery and decide to move to the Maldives, I'd probably only be willing to contribute to paying to the building of a seawall if the prime minister told me that if I didn't, a tidal wave would swamp the island within two years.

**Can you translate this concept into everyday life?**

If a person is employed today, but at the same time knows that the precariousness of economy means that job is at risk, he or she doesn't enjoy daily life. That's the difference between sustainability and vulnerability. The perception of the future as uncertain from today's vantage point can determine behavior that produces a reduction of uncertainty in the future.

**But don't people react only to real and present danger?**

That's where the matter of politics becomes crucial. A

popular Vienna mayor of the 18<sup>th</sup> century taxed citizens to accumulate the money necessary to fortify the banks of the Danube. He was loathed for it at the time, because his decision went against the wishes of his constituents. But he became a city savior a few decades later when those fortifications saved the city from what would have been disastrous flooding.

Today's policies tend to lack the ability to assess future risk. At the Davos conference last year, the agriculture minister of a G7 country said: "I know all about the risk of climate change, and I'm absolutely convinced that represents a very real danger. But if I tell my party colleagues that they should limit economic growth to reduce the risk, I'll not only be mocked but voted out of office."

There's the point, the crux: how do you weigh the risk factor in decision-making, given that politicians are increasingly focused only on what's happening today? At Davos I advanced the idea, which others concurred with, that by adding risk indicators to our current welfare indicators (GDP and others), we could begin judging politicians on the basis not only of what they maximize for today but of what they minimize for tomorrow, in terms of limiting peril.

**It's an appealing idea, but doesn't it require unanimity on the risk indicators themselves?**

**Has there been any development in this direction?**

There have been some efforts, but we need more robust models capable of reaching indubitable conclusions, as in the case of climate change. The real problem comes up in making assumptions about the future, particular based on knowing what the available technology will be in years to come. This question mark destabilizes the debate to such an extent that those promoting it can be labeled as nothing but loose talkers. We need to know that there are economic, social and cultural forces at work trying to dismantle the idea that the current system is in fact unsustainable.

**Where should this debate be played out?**

In my view, it should be dealt with at two levels. For starters at the international one. There should be something like the existing Intergovernmental Panel on Climate Change (IPCC) to permanently bring together the world's best scientists, with the support of individual governments, this time not to discuss climate but overall

sustainability. The approach taken by the international body should then be replicated and used at national level, where political changes can have an effective impact. For economic, environmental and social matters you need something similar to what the LINK forecasting project has represented for the global economy. Economist Lawrence Klein pioneered the field in 1969, and thanks to collaboration between national institutions has set up economic models that are applied to some 80 countries. Putting a similar process into motion regarding sustainability could help develop reliable risk indicators for the human population as a whole.

**In addition to "top-down" approach is there also "bottom-up" one?**

Many cities, as many companies, are now facing serious sustainability problems. In business, for example, debate regarding corporate responsibility is growing, with the support of many international consultancy groups that are offering specific indicators. So-called "ethical markets" are also growing, fueled by investment funds that make decisions based on taking sustainability issues into account. It would be interesting to relate micro and macro indicators, which so far have been viewed separately. At the same time, moving from the saying to the doing isn't easy. Look at the recent British Petroleum incident in the Gulf of Mexico. Until that platform exploded,

The 2010 World Economic Forum at Davos.



ed, BP was considered among the leaders in terms of corporate and social responsibility. If sustainability reports aren't truly "lived" by the companies that pledge themselves to them, they're nothing but a façade. That's also true of macro indicators when, as it turns out in the case of Greece, published statistical data was manipulated.

**Where does Italy rank in terms of gathering data on sustainability?**

At the end of the year, ISTAT will submit its first set of sustainability indicators, in the context of a EUROSTAT project. But we have to say openly that it's patchwork project. It will include present and future well-being projections and lay out of specific behavioral patterns. It will also compile a synthesis of relevant sector-by-sector questions and policies. What this information won't be able to tell us in full is whether we're in fact on a sustainable path. For example, knowing the country's total fuel consumption, while a useful indicator for the transport ministry in terms of developing efficiency energy policies, says nothing about overall sustainability. So we're not expecting too much from the data.

**So Italy is also in search of an overall sustainability model?**

Certainly, but I have to note that in Italy discussion that takes up sustainability factors takes into consideration only the environment. It's no coincidence that the environment ministry is in charge of these matters. In Norway, it's the finance ministry, and elsewhere it's the prime minister. This reinforces the idea that the matter cuts across boundaries and needs to be reconciled with economic and social issues. It's also interesting to note that in June, Italy's National Council for Economics and Labor (CNEL), following OECD recommendations on how to follow up the Stiglitz Commission report, decided to provide a platform to discuss the extent of progress toward sustainability in Italian society. This means dealing with different aspects of existing personal welfare but also addressing future well-being, which is to say global sustainability. A motion was passed that provides for an open round-table discussion, open to public contributors, whose goal is to assess the extent of progress. ISTAT will provide technical assistance to help build indicators from the debate, which will also discuss how the public should be informed. In short, the process has begun. We'll see if we can carry it forward. ●