

# SUSTAINABLE DEVELOPMENT GOALS FOR A NEW ERA

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I want to describe what I believe to be the central drama of our time. In many ways humanity has squandered the time it once had to adjust to environmental realities. Now our backs are up against the wall. As the Church says, we are living in history, and our generation's history is the threat of unprecedented, global-scale environmental catastrophe.

With a population of 7.2 billion, and an economic output measured at \$12,000 per person (in international prices), the \$90 trillion global economy is putting unprecedented strain on the world's ecosystems, climate, and biodiversity. The world economy is very roughly 250 times larger than it was at the start of the Industrial Revolution in the middle of the 18<sup>th</sup> century. The human impacts are similarly must more vast and dangerous than ever before.

The world's governments are currently attempting to negotiate a framework to help guide humanity through the very difficult environmental crises of our own making. I want to explain that global diplomatic process because I think it is vital that these negotiations be successful. And since global cooperation is fragile and tenuous, there is absolutely no guarantee of success. For that reason, I believe that this week's meeting is extraordinarily timely from the point of view of global diplomacy. We can give a big boost to the on-going talks.

## **Humanity has entered the Anthropocene: a new era of risk and possibility**

As Professor Crutzen has taught us, we have entered a new environmental era on the planet, which he has helped to christen the *Anthropocene*. This new concept is deeply correct and, indeed, both startling and extremely important. We are now in a human-driven physical world. Sometimes the scientists say that humans have become the main "drivers" of planetary-scale change, but if we're "driving" we are certainly not paying attention to how we're driving! The global economy is changing the planet in extraordinarily dangerous ways and yet our political systems are displaying an almost complete inattention to these dangerous trends.

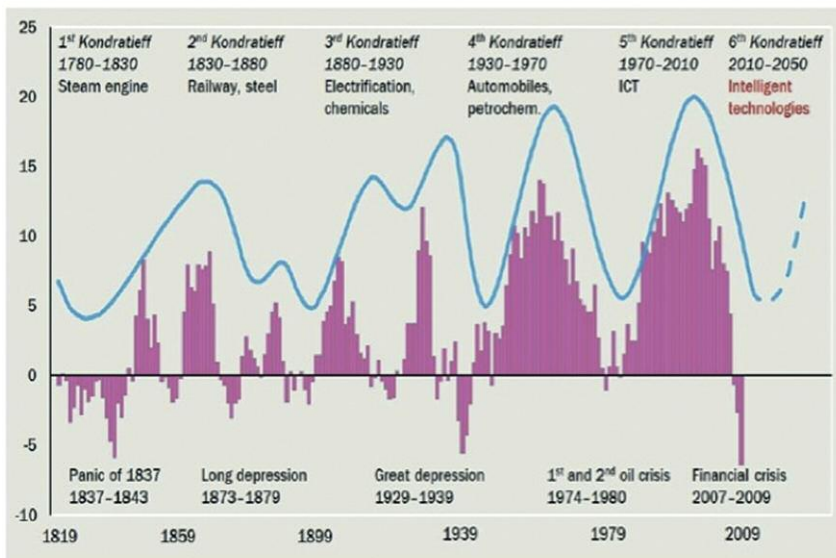
I'd like to refer to a statement of President John F. Kennedy, made half a century ago, because I think it applies to us today. In his inaugural address, Kennedy said, "For man holds in his mortal hands the power to abolish all

forms of human poverty and all forms of human life”. In essence, we are living in a time of extraordinary choice. Our technological capacity can be uniquely beneficial: we can end extreme poverty in this generation. Yet it can also be incredibly destructive, not only in the sense of the thermonuclear risk that President Kennedy referred to, but also to environmental destruction that threatens us in our generation.

How did we arrive at this dangerous point? We are the inheritors of two centuries of dramatic technological breakthroughs. Economic history shows an almost unchanging level and character of global economic activity over the course of centuries (even perhaps a couple millennia) up till around 1750. It is only in the last two and a half centuries that rapid economic growth in the modern sense has occurred, and this unprecedented economic growth has been the result of waves of technological change.

The biggest breakthrough came with James Watt (and his predecessor Thomas Newcomen), who first showed how to use fossil fuel – ancient solar energy stored in the form of coal, oil, and gas – for motive power. Watt’s steam engine and other fossil-fuel-using technologies that followed (e.g. the internal combustion engine and gas turbine) have fundamentally

## Waves of Technological Transformation



**Figure 1.** Kondratieff waves of technological transformation.

transformed the world economy, and now the planetary environment as well. Indeed, since Watt's steam engine (in 1776), there have been a series of fundamental technological advances sometimes called "Kondratieff waves" (Figure 1). For example, we are now living through the wave of the Digital Revolution, which is again reshaping the world economy.

These waves of technology have shaped the modern world, and the growing human impact on the environment. The path of total world output (sometimes called the Gross World Product, or GWP), is therefore unlike anything seen before the modern economic era. Figure 2 shows the best reconstruction we have of the long sweep of GWP. The essence of the picture is that history changed around 1800 (with the first Kondratieff wave and those that followed). Gross World Product has soared vertically, but we have not adjusted to this reality, either institutionally, morally, ethically, or cognitively. Yet this change has fundamental implications for how we live with each other and how we live with the planet.

The path of the global population (Figure 3) looks like almost the same curve as GWP, and it is indeed closely related. For the long stretch of human history the global population virtually remained almost unchanged. The change over centuries was so small that it was nearly imperceptible to those who lived at any time in the preindustrial age (except of course for rare episodes such as the Black Death in Europe). Yet after 1800 or so, the world's

## Soaring World Output

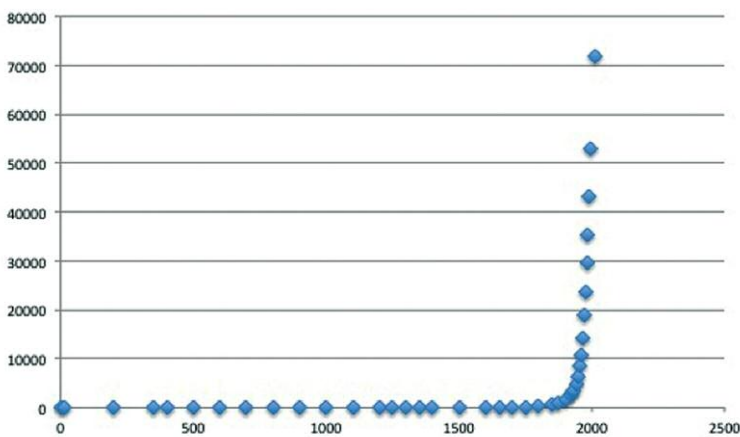
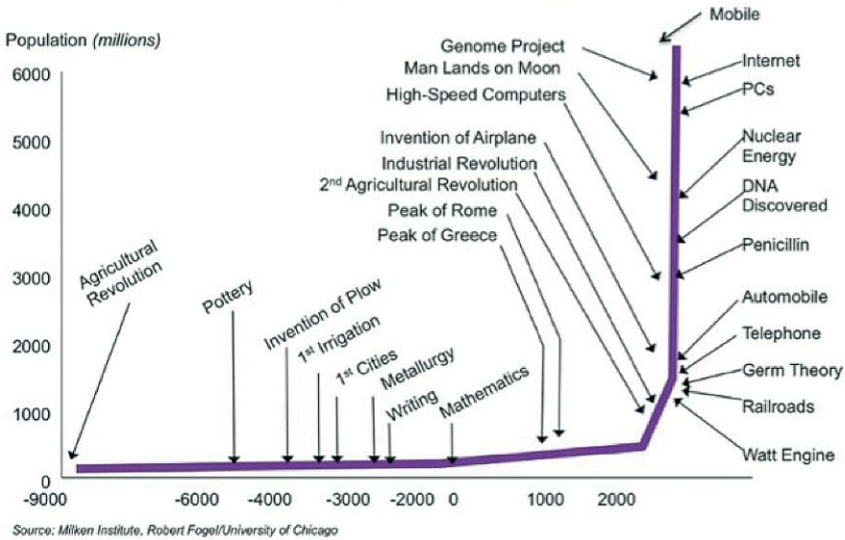


Figure 2. World Output.

## Growth of World Population and the History of Technology



**Figure 3.** Growth of World Population and the History of Technology.

population began to soar. This is mainly (though not only) because the advances in global technology included the ability to grow vastly more food-stuffs to feed a growing world population. The result is that the global population has risen roughly eight-fold since 1800, from around 900 million to 7.2 billion people today.

Figure 4 shows another curve that looks similar. It is, indeed, another case of geometric growth. This one is *Moore's Law*, the doubling of the “transistor count” on advanced integrated circuits roughly every 24 months, a doubling process that has been occurring since the advent of integrated circuits around 1958. Moore's Law describes our generation's Kondratieff Wave, the Digital Revolution. The ability to store, process and transmit data in bits has improved by roughly one billion times since 1958. This great advance in digital technology is already transforming the world economy, the nature of jobs, and the pursuit of science in almost every sphere. The digital revolution gives us great technological power, both for good (to fight poverty) and alas also for bad (for example through more advanced spying or accelerated environmental catastrophe).

## THE INFORMATION REVOLUTION

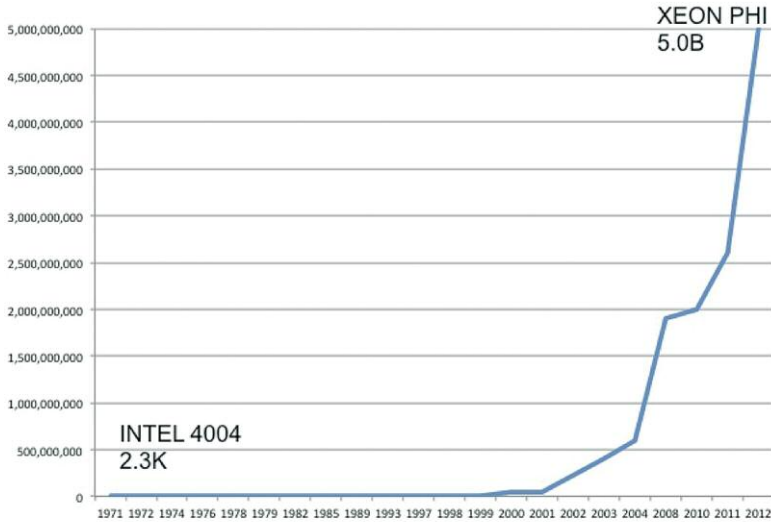


Figure 4. The Information Revolution.

The Result of the Technological Revolution is a Fully Interconnected, Increasingly Urban, Highly Productive Global Economy



Globaia

Figure 5. The Connected Global Economy.

The cumulative result of the five Kondratieff Waves is a fully interconnected world economy and global society. These interconnections are depicted graphically in Figure 5. The white lines in the figure depict the global aviation routes; the blue lines depict the ocean-shipping lanes; and the green lines show the road networks. The bright white dots are major urban agglomerations. All in all, the world is deeply interconnected as never before. This is, of course, what is meant by “globalization” in our era.

There is of course much good news associated with this stunning technological progress. One piece of good news is that the global rate of extreme poverty has been falling significantly in the past two decades. China has been the greatest exemplar of that progress. China’s rate of extreme poverty, according to World Bank data, fell from around 60% in 1990 to around 12% in 2010. Overall headcount poverty (the proportion of households living below the World Bank’s poverty line) declined by more than half between 1990 and 2010, from around 43 per cent at the start of the period to around 21 per cent at the end of the period. This reduction of poverty represents a marvellous improvement in the quality of material life, and it is happening in many parts of the developing world, though most notably in Asia, and then in Africa since around 2000.

### Extreme Poverty is Falling and Can Be Eliminated



**Figure 6.** Extreme Poverty is Falling and Can Be Eliminated.

Yet the good news of economic advance is offset by considerable bad news as well. First, the economic progress has been unequal in its impacts and many of technological changes have caused major shifts in the distribution of jobs and incomes. For example, the demand for unskilled labour seems to have declined markedly in the last twenty years. This is in turn leading to higher youth unemployment, falling incomes of young people, and rising social stresses in many parts of the world. Figure 7 shows pictures of the police confronting young people in clashes in major cities all over the world. This unrest is becoming a nearly universal phenomenon.

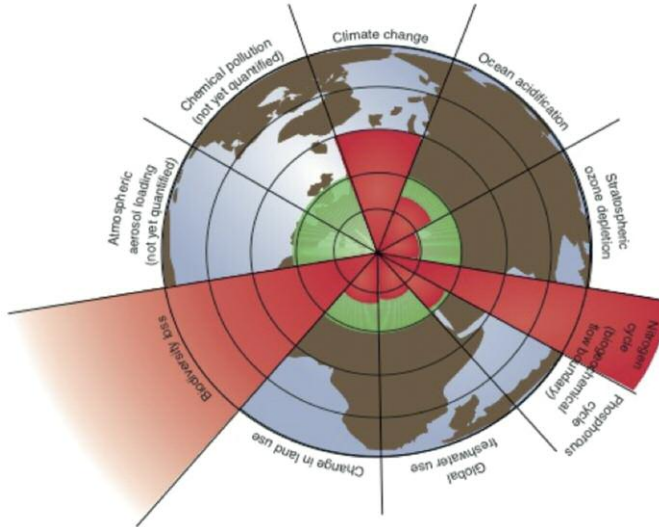
Yet the global environmental impacts of global economic development are probably even graver than the social dislocations. As the result of massive economic growth and the neglect of the physical environment, humanity is “trespassing” on a number of key *Planetary Boundaries*. The phrase Planetary Boundaries, coined in 2009 by a group of world-leading ecologists, signifies various environmental thresholds that humanity is cross at great peril. These Planetary Boundaries are depicted in Figure 8. They include

#### RISING INEQUALITY, YOUTH UNEMPLOYMENT, AND SOCIAL INSTABILITY



**Figure 7.** Rising inequality, youth unemployment...

## PLANETARY BOUNDARIES IN THE AGE OF THE ANTHROPOCENE



Source: Rockström et al 2009a

**Figure 8.** Planetary Boundaries.

human-induced climate change; human-induced acidification of the oceans; human-induced release of nitrogen and phosphorus into the environment (mainly from fertiliser use); massive freshwater depletion; massive deforestation and other land use changes; massive human-induced destruction of biodiversity; massive aerosol pollution (e.g. through burning of fossil fuels in major cities); and massive chemical pollution. The economic growth curve has turned up so steeply, and our environmental neglect is so severe, that humanity is crossing the safety boundaries of the planet.

And the dangers are evident in every part of the planet. Let me illustrate those dangers with a few recent photographs.

Figure 9 happens to show my own city, New York City, on the occasion of the Super-Storm Sandy that hit the northeast coast of the US in late October 2012. You can see the New York City police cars floating down 10<sup>th</sup> Street in downtown Manhattan. Yet New York City's flooding is not unique. Bangkok, Beijing, Belgrade and countless other cities have had similar massive floods in the past three years.



MANHATTAN, HURRICANE SANDY, OCTOBER 29, 2012



Figure 9. Manhattan, Hurricane Sandy.

BEIJING ENVELOPED IN POLLUTION, JANUARY 2014



Figure 10. Beijing enveloped in pollution.

## Algal Bloom, Qindao, Shandong Province, 2013



**Figure 11.** Algal Bloom.

Figure 10 shows another planetary boundary: aerosol pollution. The photo is of Beijing in January 2014, when Beijing's air became so polluted that breathing the air became a major health risk. The best advice to Beijing residents was, "Don't breathe for the following three days!" The air in many Asian mega-cities is unsuitable for human health and safety. This air pollution can reduce life expectancy by several years.

Figure 11 is an illustration of eutrophication, the massive algal blooms (followed by hypoxic or "dead" zones) that result from the massive poisoning of rivers, estuaries, and coastlines by nitrogen and phosphorus fertilizers carried by rivers and groundwater from millions of farms to the coast.

Figure 12 shows a satellite image of what by some measure was the strongest land-falling tropical cyclone in modern history, Typhoon Haiyan of November 2013. This massive typhoon struck the Philippines and caused mass destruction, dislocation and loss of life. Such is our new world, one of increasingly frequent and intense climate-related catastrophes.

Another key kind of disaster are massive and increasingly frequent droughts that are plaguing so much of Africa and the Middle East (as well as the US state of California in recent years). I see these droughts in my development

By some measurements, Typhoon Haiyan (November 2013) was the most intense storm ever to make landfall



**Figure 12.** Typhoon Haiyan.

activities month by month, whether it's the Horn of Africa, Yemen, or the Sahel (Figure 13). Human-induced climate change seems to be contributing to falling precipitation and rising evapotranspiration in many parts of the world's drylands. The result is drought and in severe cases, famine. These increasing droughts are hitting against rising populations in these very places. The result is like the crossing of two scissor blades: falling rainfall on one blade, and rising populations on the other. As with the blades of a scissor, these contrasting trends are cutting society to the bone, threatening their health, food security, and political stability. Many drylands – Somalia, Yemen, and Syria to name three cases – are already succumbing to chaos.

Sustainable Development is the global concept to address this quite harrowing and unique reality of our time. Sustainable Development as a concept calls for a holistic and integrated vision of society, in which our economic objectives, such as ending extreme poverty, are put alongside our social objectives such peaceful communities, stable families, and effective governance, as well as our environmental objectives of stopping climate change, controlling pollution, and protecting ecosystems and biodiversity. The shorthand goal of Sustainable Development is “Inclusive and Environmentally Sustainable Growth”.



**Figure 13.** Chad, 2012.

The concept of Sustainable Development came to public awareness 27 years ago through the World Commission on Environment and Development, most often called the Brundtland Commission (after its chair, Dr Gro Harlem Brundtland). The concept was then incorporated into the three multilateral environmental agreements reached at the Rio Earth Summit in 1992, on climate change, biodiversity and desertification. Yet the grim reality is that these three treaties have not worked. International law has not proven to be a match for the juggernaut of the world economy. In every environmental domain we are by far worse than we were in 1992.

When the world's governments met in June 2012 on the 20<sup>th</sup> anniversary of the Rio Earth Summit, at a meeting known as the Rio+20 Summit, the main challenge facing the governments was how to bolster sustainable development. In the key recommendation of the Summit, the world's governments called for a new set of Sustainable Development Goals (SDGs) to help guide the world during the next fifteen-year period from 2016 to 2030. One of the reasons for this interest in high-level SDGs was the relative success of another set of high-level goals, the Millennium Development Goals (MDGs), on which I've had the honour to advise former UN Secretary-General Kofi Annan and now UN Secretary-General Ban Ki-moon. The MDGs have played a critical role in drawing the global attention to extreme poverty. The

hope is that Sustainable Development Goals will similarly draw the world's attention to the dire challenges of sustainable development.

The key importance of the SDGs is that they invite the entire global society to become engaged in the Earth's future. The SDGs move us beyond the rarefied realm of global treaties – which involve mainly lawyers, diplomats, negotiators, and politicians – to the realm of global civil society. With the SDGs we have a global compass, a lodestar, a set of shared objectives, to help move the world towards sustainable development.

Please permit me to quote President Kennedy once again. In 1963, Kennedy successfully negotiated the first major peace treaty with the Soviet Union in the Cold War era: the Partial Nuclear Test Ban Treaty. In the course of pursuing that agreement, Kennedy described how a clear and shared goal may be a source of progress and inspiration: “By defining our goal more clear – by making it seem more manageable and less remote – we can help all people to see it, to draw hope from it and to move irresistibly towards it”.<sup>1</sup>

The specific idea of Sustainable Development Goals is to combine society's goals of ending extreme poverty; increasing social inclusion with reduced inequality; and promoting the environmental sustainability of food systems, energy systems, ecosystems and biodiversity. All of this should be accomplished within a framework of global governance and partnerships needed to achieve the economic, social, and environmental aims.

I am now directing a process for UN Secretary-General Ban Ki-moon called the Sustainable Development Solutions Network (SDSN). The SDSN is a new global network of academia, civil society, and the private sector that works with the UN and with national and local governments both to set the SDGs and then to achieve them. The SDSN will work from 2016 to 2030, the period of the Sustainable Development Goals.

As one early phase of the SDSN work, the Leadership Council of the SDSN has made a recommendation to the UN General Assembly and Secretary General as to what the SDGs might be. The SDSN has recommended ten main goals, listed as follows:

- End extreme poverty
- Promote sustainable growth and jobs
- Education for all
- Social inclusion for all
- Health for all

<sup>1</sup> JFK, American University Speech, June 1963.

- Sustainable agriculture
- Sustainable cities
- Sustainable energy and climate change
- Sustainable biodiversity
- Good governance and global partnership

The SDGs are being negotiated now at the United Nations, and will be adopted in September 2015 at a summit of world leaders. So far, the UN General Assembly has narrowed the list to seventeen headline goals, very similar in fact to the SDSN list. I expect that the list of seventeen will be refined to around ten goals by the end of the process, very similar to those on the SDSN list. These ten or so SDGs will be accompanied by perhaps 30–40 targets (three to four targets per goal), and perhaps 100 numerical indicators that will be used to track progress towards the goals. The SDGs (and the targets and indicators) will be the subject of annual review by the UN member states.

Nothing about achieving global Sustainable Development will be easy. We are very, very close to losing the possibility of avoiding climate catastrophe. In 2010 the world's governments agreed to take action to avoid a 2°C rise of mean temperature above the pre-industrial level. We already have a 0.9°C increase, roughly half way to the globally agreed limit. If we continue with business as usual, the world's mean temperature is likely to rise by as much as 4°–6°C by the end of this century. This would likely prove to be calamitous. The only way to achieve the 2°C target will be through decisive cooperation among the world's major economies. A recent report of the SDSN, called the *Deep Decarbonization Pathways Project Report*,<sup>2</sup> shows how the 2°C goal can still be met, but only through a very deep and rapid transformation of the global energy system to low-carbon energy sources and uses.

The fact of the matter is that humanity is still rushing headlong towards multiple collisions with nature and with each other, within highly divided and unfair societies. And yet, we have the means to succeed; that is, to combine the end of poverty with social inclusion and environmental safety. The most essential quality for our survival will be a shared moral impulse to do the right thing: to protect each other and nature from our greed, scientific lack of understanding, and moral disregard and carelessness.

In conclusion, I believe the world desperately needs – and yearns for – a shared global ethics to underpin the forthcoming Sustainable Develop-

<sup>2</sup> Available online at <http://unsdsn.org/what-we-do/deep-decarbonization-pathways/>

ment Goals. The debate in New York is still very much a technical debate. It is mainly about international law, institutions, technologies, finance, and timetables. As of yet, it is only implicitly about values. We are still lacking an explicit and informed discussion of global ethics.

There is no doubt that the world is yearning for such a moral renewal. We see clearly the global response to Pope Francis's pronouncements. This is global, this is worldwide, this is across religions. I personally believe that the social doctrines of the Church offer a global inspiration on these issues, across the major religions. I refer to Church social teachings that, in my mind, are fundamentally in line with Sustainable Development and the SDGs.

The Preferential Option for the Poor is at the core of the concept of ending extreme poverty. Pope Paul VI's wonderful statement that "Development is the new name for Peace", is a similarly vital concept. The doctrine of the Universal Destination of Goods reminds us that a global market economy must be underpinned by ethics. The Church teaches us of the moral responsibility towards Creation, the importance of integral human development, and of the importance of subsidiarity in building institutions. (The SDSN recommends an SDG for urban areas in order to emphasize the important of communities and local governments).

In the final analysis, we do not face an economic, technological, or financial crisis. We face a moral crisis. If we can rally our spirit, the rest will follow. As Pope Francis has powerfully put it, we face the "Globalization of Indifference". The SDGs (and other global objectives) can help us to overcome that indifference. By engaging global society through clear global goals, and by infusing those goals with a shared moral underpinning, humanity in our time can step back from the environmental precipice. We can achieve prosperity, social trust, and a safe planet. Indeed, any other course of action would threaten our very survival. Our course must be one of hope, cooperation, compassion, and positive action.