# What Does Sustainability in Communications Mean?

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In 2015 the United Nations General Assembly adopted a set of Sustainable Development Goals (SDG) that are to be reached by the year 2030 [1]. In essence, these goals are an attempt to resolve the issue of the "Great Divergence" [2] between industrially developed and undeveloped countries. SDG 9, labeled "Industry, Innovation, and Infrastructure," is focused on building resilient infrastructure, promoting inclusive and sustainable industrialization, and fostering innovation. Communications systems are the core of a huge industry, thrive on innovation, and are a critical element of the infrastructure of modern societies. So, the clear message is that communications systems must themselves be sustainable over the long term and are also essential for the realization of the collective SDG. The question is, what stands in the way of realizing these goals?

First, we should acknowledge the tremendous progress that has been made in recent decades. The spread of mobile phone and data networks, the ubiquity of IEEE 802.11 WiFi, and the girdling of the globe by immensely capable optical networks have brought communications technologies to literally billions of people. Looking forward, through the development and adoption of Internet of Things (IoT) technologies, not only people, but manufacturing, transportation, power, water, housing, and agriculture are slated to be connected to the global communications infrastructure.

But mere connectivity is not sufficient to declare something a sustainable communications system. We should expect more from such systems. We should expect that these systems serve the needs of humans — and the planet — in a larger sense of sustainability. The great urbanization of societies over the last two centuries has brought more humans into closer proximity with each other than ever before in human history. Economic globalization has forced multiple human societies and cultures to interact with each other on a scale never before attempted. The Internet, broadly defined, has played a key role in facilitating and mediating these necessary global interactions over the last few decades. But the Internet, as it currently exists, is not a stable and sustainable communications system. Because of this, the current Internet will not suffice to achieve the SDGs.

What is the evidence for this? It is true that the Internet has brought us pervasive access to news, email, online shopping, entertainment, and a variety of social media. It has enabled the creation of multibillion-dollar businesses and given employment and purpose to millions of people. But it has also enabled international phishing scams, denial of service attacks on financial institutions, malicious botnets, dark-web drug sales, distribution of child pornography, and state-sponsored assaults on accountable journalism and democratic elections. The edifice of the global Internet will collapse for both technical and political reasons if these issues are not addressed soon, and because nothing is in place to replace it, that collapse will endanger the achievement of all the SDGs.

How will we know when a communications infrastructure that is itself sustainable is at hand? We should deem communications systems sustainable when they are designed to allow humans to realize the potential of their abilities for creative thought, to advance the development of human culture, and to achieve the full range of sustainability goals. This means, for example, that communications systems that suppress the exchange of scientific thought are not in harmony with sustainability goals. Communications systems that enable the disruption of democratic systems of governance are not in harmony with sustainability goals. Communications systems that isolate one culture from another to avoid "contamination" from foreign ideas are not in harmony with sustainability goals.

Achieving a sustainable global communications system will not be easy. Many technical and social hurdles remain to be overcome. Issues of identity, privacy, security, authentication, accountability, accessibility, and fairness need to be addressed. However, when (not if!) solutions are found, because they will need to be deployed on a global scale, standards will play a vital role in achieving and maintaining a sustainable global communications system. Sustainable communications systems, by definition, will need interoperability, and standards are the way to achieve that.

## References

[1] United Nations, *The Sustainable Development Goals*. United Nations Press, New York, USA, 2017.

[2] G. Clark, *A Farewell to Alms: A Brief Economic History of the World*. Princeton University Press, Princeton, NJ, USA, 2007.