

## **Sustainability Beyond Science and Technology**

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A cascade of experiences set me on a life in science and technology that included being a scientist astronaut, and my experiences in space forever changed my perspectives on literally everything.

Floating in microgravity in an artificial environment of all too pure air and water in the space shuttle, I came to be truly appreciative of the tenuous fragility of our atmosphere that has protected all life for the last 4 billion years in spite of changing its components. The present atmosphere embraces the 50 million life forms now on this planet. Each time I returned from space to Earth and the hatch opened, I was stunned with the overwhelming sense and smell of life forms, and astonished with the deliciousness of my first glass of real, natural water.

Seen from space, the sun lit area of our globe shows only the forests and coral as proof of life. Only with the darkness can the presence of humans be seen, with cities providing nebula-like lighting, and roads and railways creating a spider's web of connections. Each brightly lit community represented a seemingly sustainable society. Unseen are the almost speed of light connections of broadcasting, the Internet, and communications. As a result of science and technology, the human population has exploded to over 7 billion, and is still growing and connecting.

In the last 10,000 years, humans have imposed their influence on Earth through farming and civilization. Within just the last 200 years, the industrial revolution and further cultivation and civilization have had a profound, almost irreversible impact.

Science has been warning us of global limitations and challenges that influence all life on Earth. These are natural resources, the reduction of bio-diversity, climate change, global warming, and the ever-increasing number of humans. This presentation will address and analyze a strategic approach to meet those challenges that must go beyond science and technology in order to ensure the sustainability of our species, while at the same time living with this planet of life. We must understand the connection or relationship between the Earth's environment and humans, and identify a possible path to take into the future of our planet, and our species.

We recently launched TSUNAGARI projects at the National Museum of Emerging Science and Innovation (Miraikan) to be the bridge between cutting edge science communities and the worldwide general public, suggesting the ultimate goal of science and technology as a part of our culture for the sustainability of the present, and future generations. A key area to be addressed will be the importance of science communication to fulfill the above ambitions.