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Abstract

The Earth is threatened by several crises related to climate change and depletion of resources. These crises are the result of historic patterns of land use and resource extraction that took advantage of the rich ecosystem and natural resources of the planet. By contrast space habitats must exist in environments where basic resources are only available through energy intensive chemical process. This requires space habitats to be very efficient in the use of the resources needed to support their existence. This paper shows how an organized program to develop the technology needed by space habitats will produce technology that will enable human civilizations to survive climate change and move beyond its current practice of resource depletion to resource recycling. Technologies that space habitats require, controlled environment agriculture, water recycling, material recycling, resource extraction from low yield deposits will greatly reduce the impact of human civilization on the planet Earth. Space habitat technologies will enable the continued increase in the standard of living for humanity despite the potential disruptions resulting climate change and threats from depletion of existing resources. The paper then goes on to outline a research agenda for space habitats that will accelerate the development of these technologies with the goal of applying them to solve problems on Earth. Their application to address problems on Earth will then further advance the technologies their iterative development to mature them to the point where they could be successfully applied to future space habitats.

A short bio

Thomas Matula, Ph.D. is a Tenured Professor at Sul Ross State University, Texas. Dr. Matula believes in a multidisciplinary approach to strategy that integrates economics, history, and technology, providing exciting forward-thinking academic programs. A futurist, he has applied the principles of strategic development and economics to write numerous academic papers on ecommerce, online education, and the emerging field of space commerce. Recognizing that the more you understand the past the better prepared you will be to shape the future he integrates economic history into both his academic publications and his instruction.