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Contribution of Space Activities to Solving Global Societal Issues (2)

Author: Mr. Francesco Spina
Luleå University of Technology, Sweden, aerospina@gmail.com

Mr. Roberto Aguilar
Skolkovo Institute of Science and Technology, Russian Federation, roberto.aguilar@mitspacecr.com

Ms. Mami Sugaya
Remote Sensing Technology Center of Japan, Japan, msugayakent@gmail.com

Mr. Chuanzelong Guo
Space Generation Advisory Council (SGAC), New Zealand, Longee_guo@hotmail.com

Mr. Ryunosuke Yokoya
Japan, ryunosuke.yokoya@gmail.com
Ms. Catherine Raisa Kimberly P. Mandigma
Space Generation Advisory Council (SGAC), The Philippines, crkp.mandigma@yahoo.com

Mr. Kensuke Wada
Japan, dkbnw868@gmail.com

TOWARDS A SELF-SUSTAINABLE PRODUCTION OF PROTEINS IN SPACE: A PROPOSED
SOLUTION AND ROADMAP

Abstract

Nutrition is elementary for human existence and it poses numerous challenges for deep-space exploration. The food currently used during space missions, despite its promises to deliver nutritive value to the astronaut's diet, will become unsuitable and unsustainable during longer expeditions. Nowadays, soil-less techniques are regularly used to grow vegetables on the International Space Station, but sustainable production of proteins still remains an unsolved issue both in space and on Earth. This paper introduces a novel approach to this issue, proposing the production of proteins from fungi in space. Reasons and advantages of this approach are detailed, and it is demonstrated how the proposed solution can be self-sustainable. Furthermore, the properties of fungi can also provide solutions for water filtering and waste management, as well as other emerging applications. A roadmap is proposed, which aims to accelerate the development of the related technologies needed in space, while using them to solve pressing global challenges on Earth.