School Name: Grades of Green
Project Title: RISE Climate Solutions Campaign
Advisor's Name: Ricardo Haragutchi

Summary: The RISE Climate Solutions Campaign was created to raise awareness of the dangers we face from global warming. Several solutions were discussed and shared with a wider audience consisting of students worldwide, especially the students with special needs and disadvantaged students. The whole process included knowledge transfer, prototype replication, online conference and hands-on STEM booth for in-person events. The focus was on sustainable environment protection solutions that would reduce the negative effects of global warming.

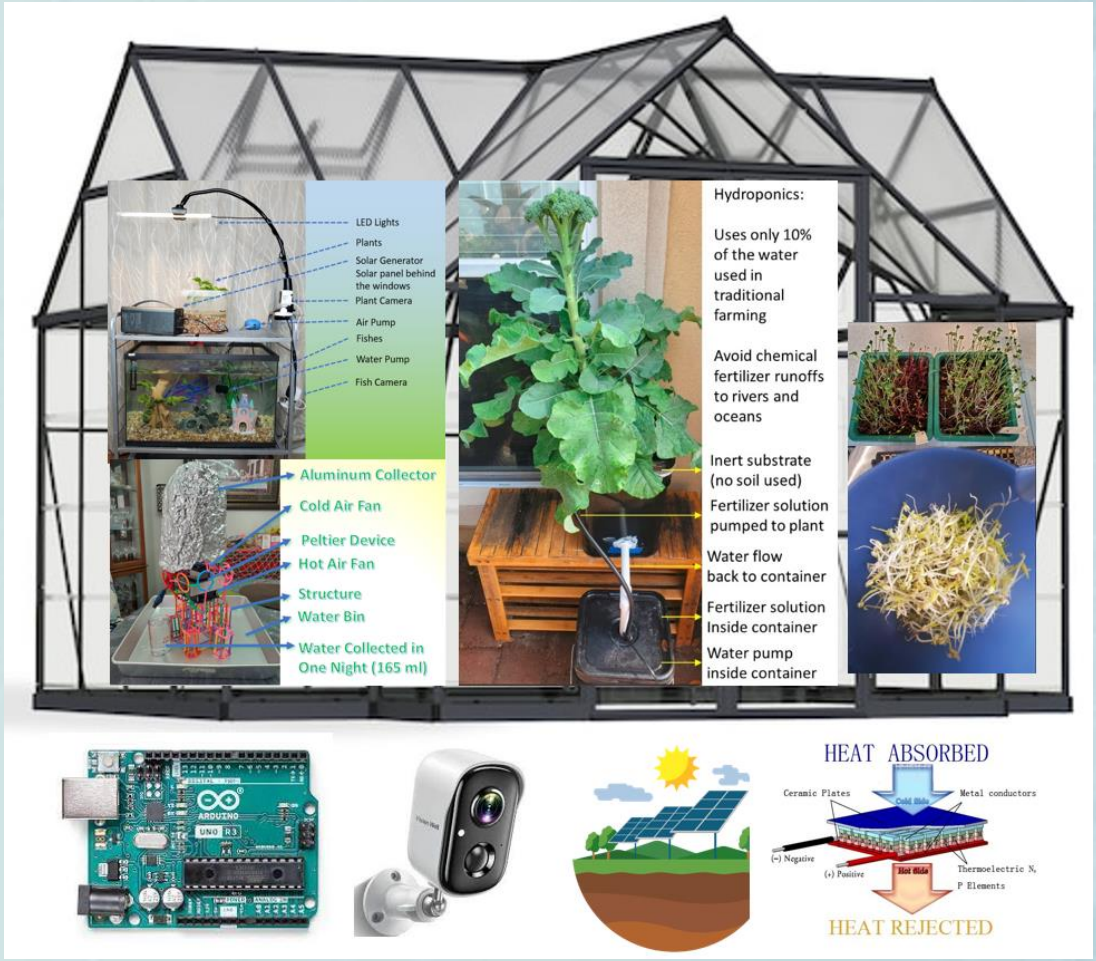
Initially focused on Sustainable Food Production, the RISE Climate Solutions Campaign became a collection of environmental protection solutions.

Sustainable Environment Protection Solutions

Developed by Nicole Haragutchi

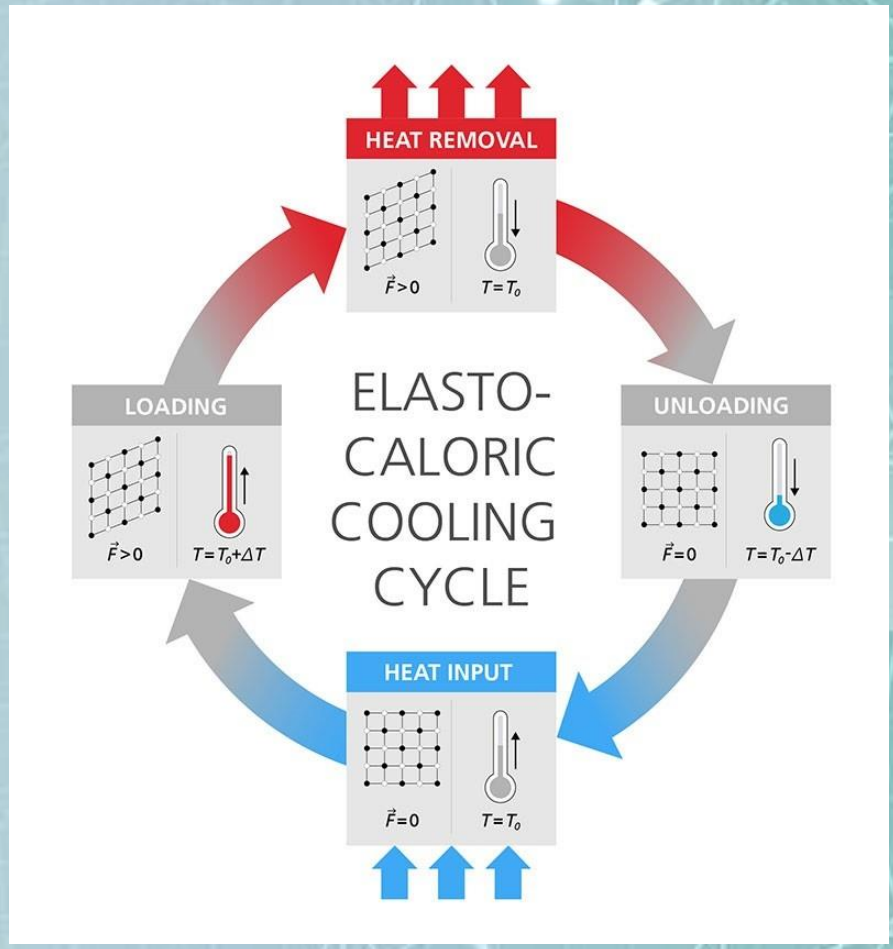
- Sustainable Food Production: The integration of modern food production methods (aquaponics, microgreens, hydroponics) with green technology (solar power and water collection from condensation resulting in 10% of water requirements and elimination of chemical products runoffs to rivers and oceans
- Solid-State Air Conditioner: Air conditioning system based on elastocaloric capability of certain metal alloys resulting on much lower energy consumption, miniaturization and elimination of refrigerant gases that enhance the greenhouse gases in the atmosphere
- Carbon Sequestration Engine with Salp: Salp is a marine creature capable of high rate of growth when there are large amount of food, and they produce a large quantity of very condensed fecal pellets that sink to the bottom. Integrated with phytoplankton farm using solar energy, they can become a very efficient carbon sinking engine, reducing global warming.
- Protein Production with Precision Fermentation: a sustainable food production also need to include protein production and precision fermentation enables that without the use of animals and using renewable energy.
- Sustainable Food Production on Mars: Integration of the Sustainable Food Production and Precision Fermentation for a complete food production that can use renewable energy, it will not require animal and can be used for colonization of other worlds.
- STEM Experiment on NASA RB09 Flight: Partnership with NASA scientific balloon flight RG09 to study the effects of outer space radiation in the germination and growth rate of plants.
- Wildfire Alarm System: Integrated set of technology modules and renewable energy with the objective of detect a wildfire, confirm that it is a wildfire and alert the end users in time to execute an escape plan and save lives.
- Earthquake Detection System: similar to the above solution but focused on earthquakes and also integrated with renewable energy.

Sustainable Environment Protection Solutions



Sustainable Food Production

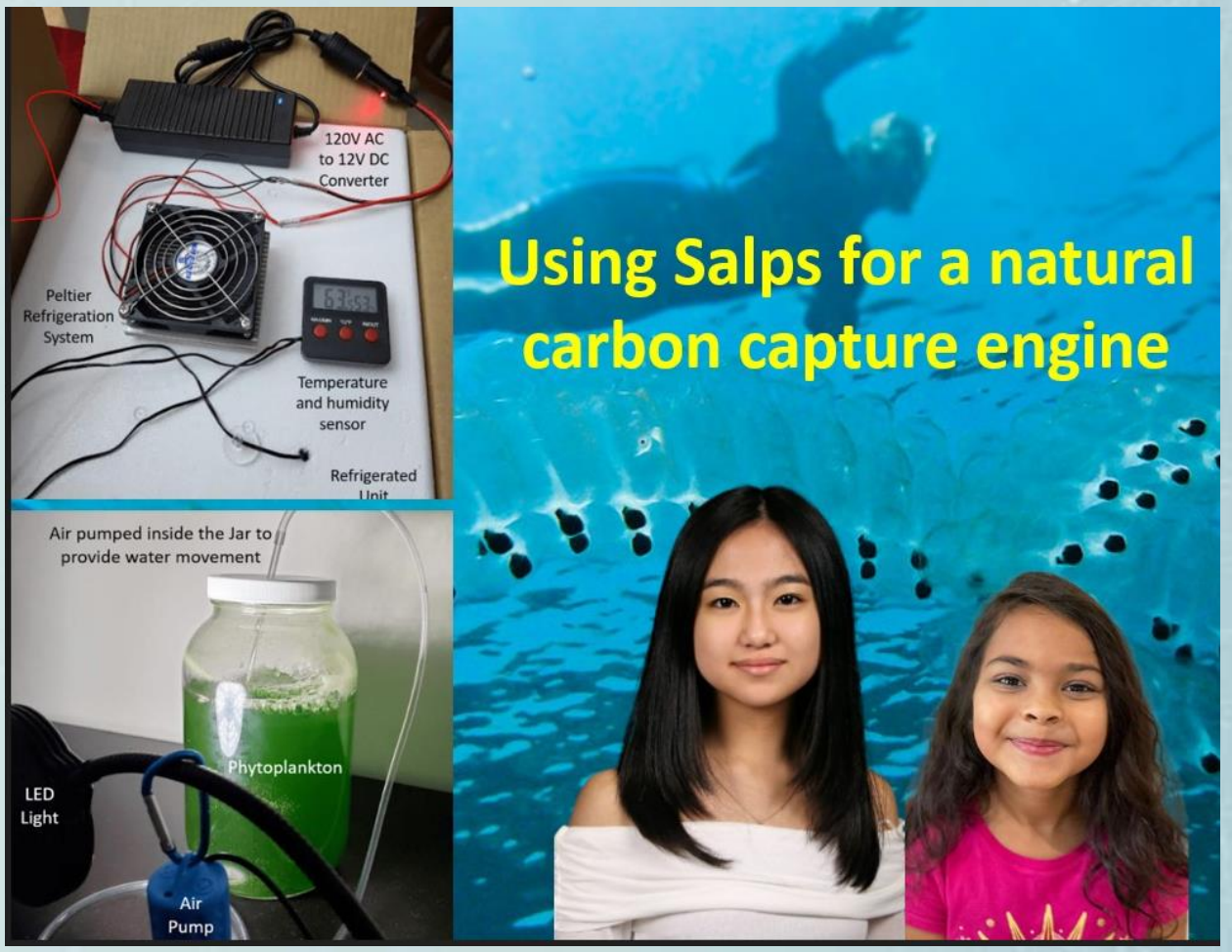
- Integration of modern food production methods with renewable energy and green technology



Solid-State Air Conditioning

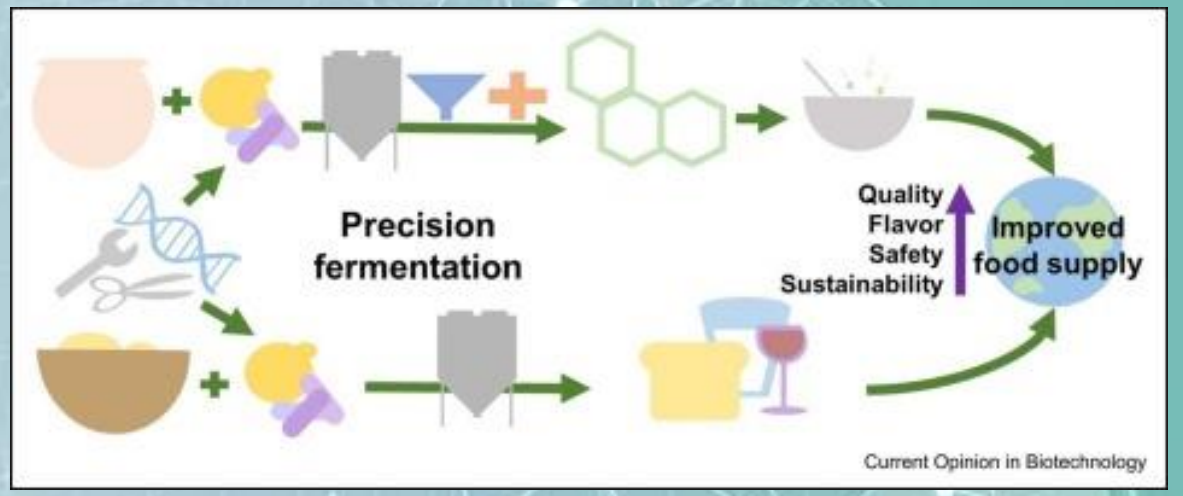
- Using elastocaloric properties for an energy efficient air-conditioner with no liquid refrigerant

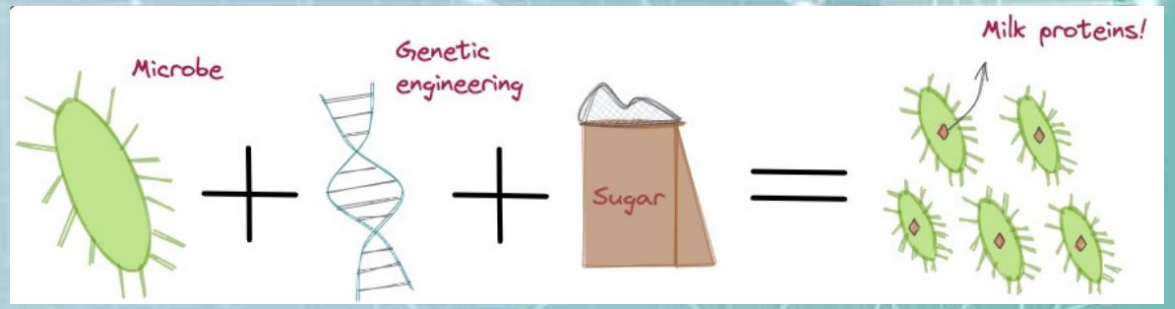
Sustainable Environment Protection Solutions



Carbon Sequestration Engine with Salps

- Using the nature's carbon sinkers to produce a carbon sequestration enginewith renewable energy

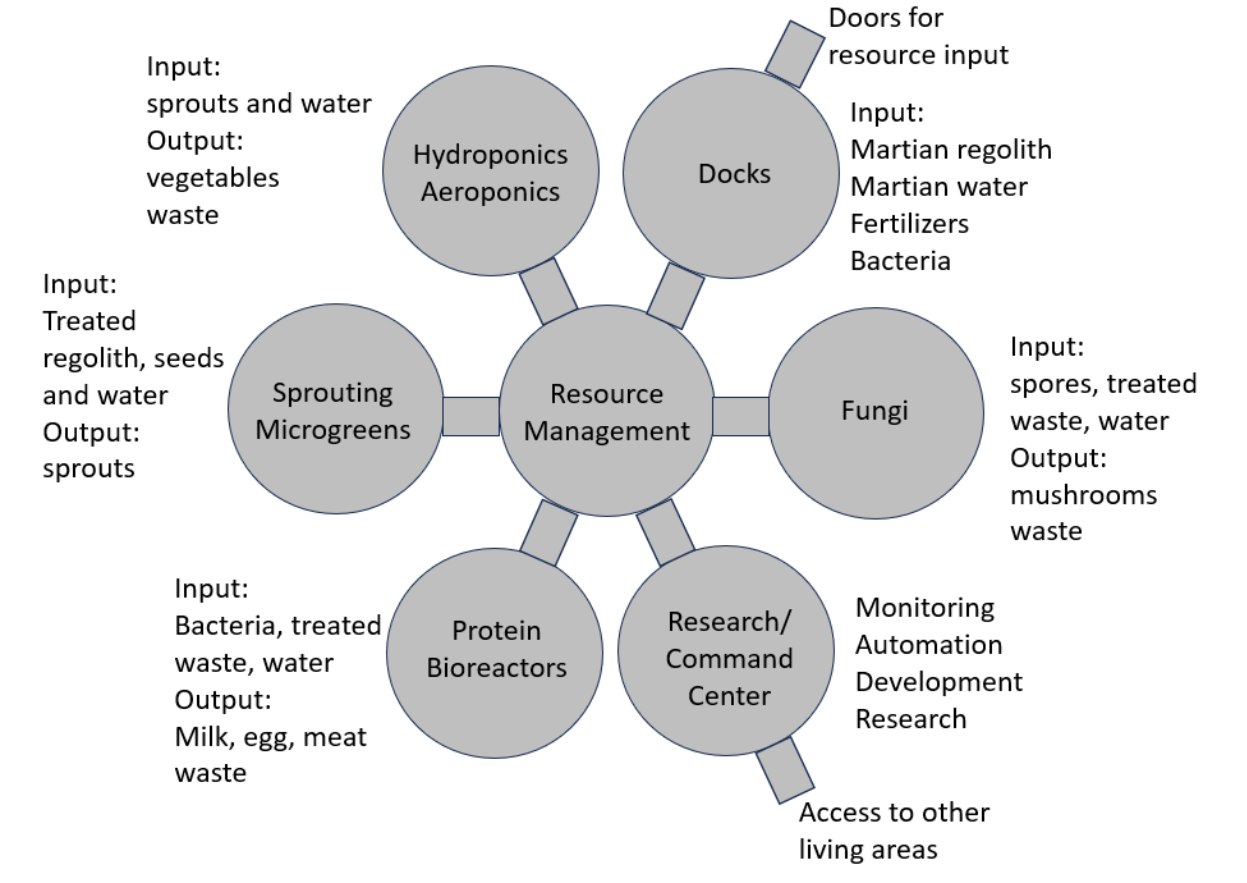


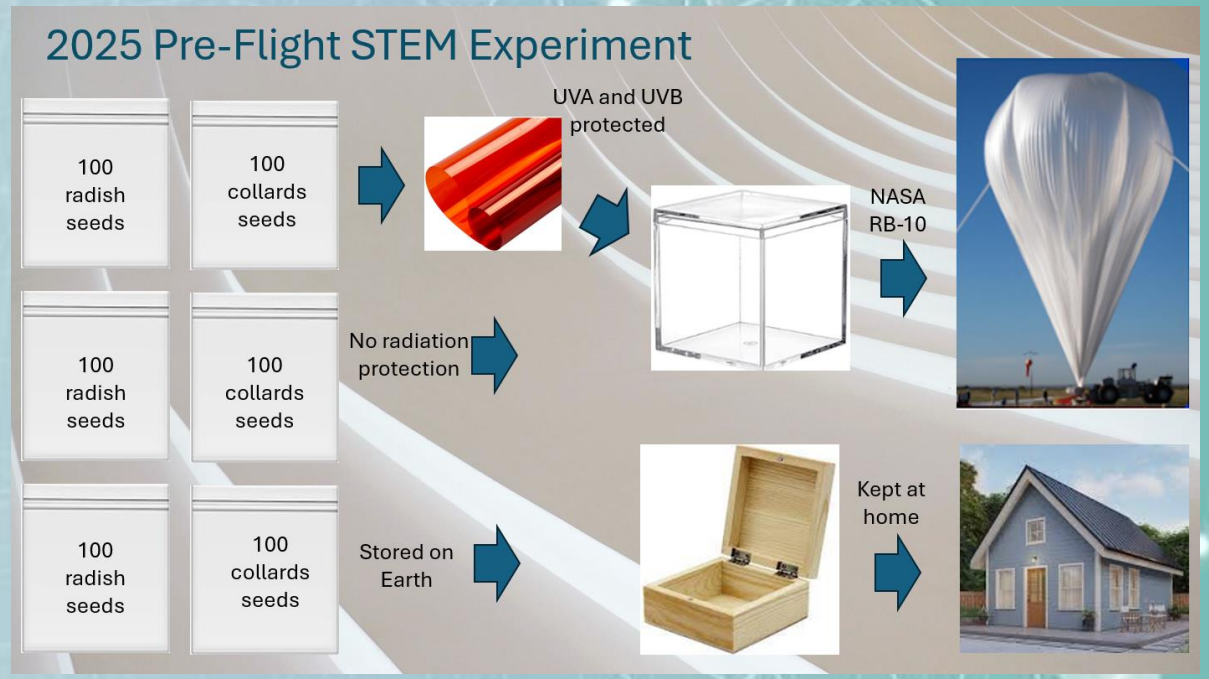


Protein Production with Precision Fermentation

- Developing production of milk, egg and meat without the animal and with the use of renewable energy

Sustainable Environment Protection Solutions





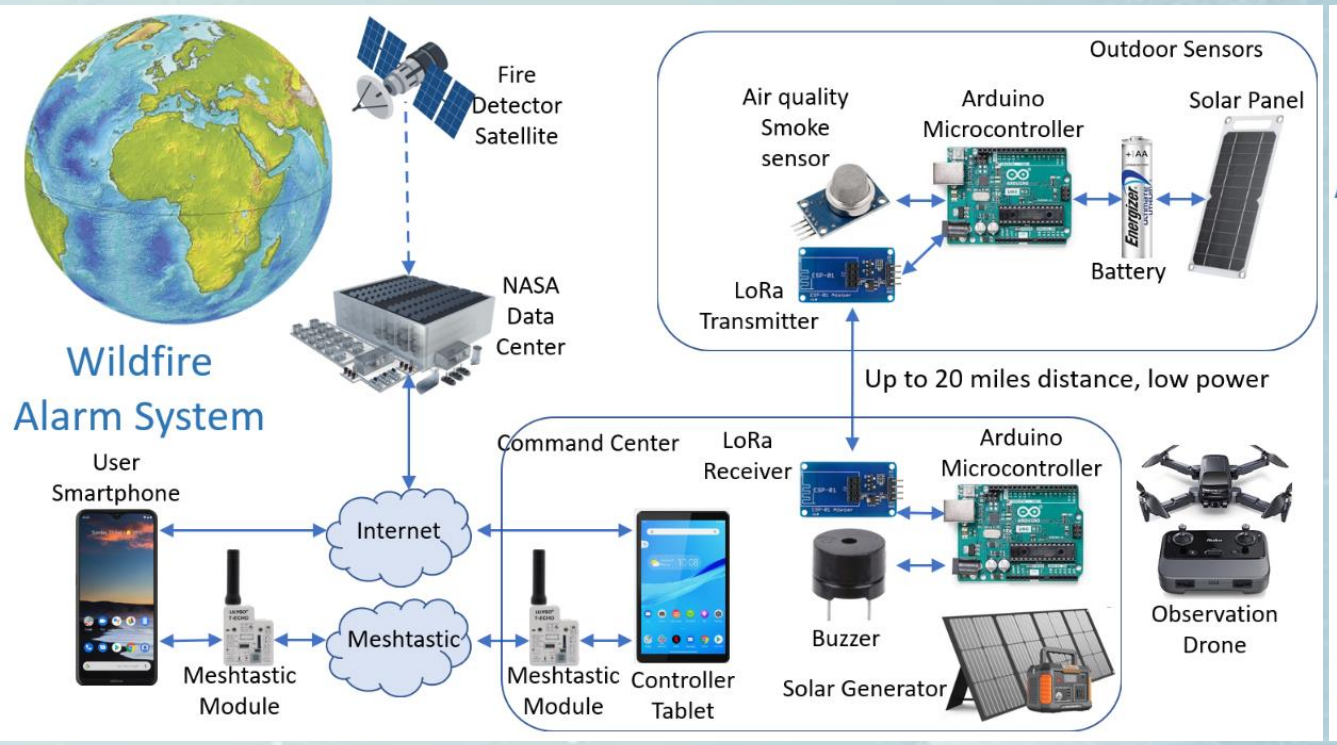
Sustainable Food Production on Mars

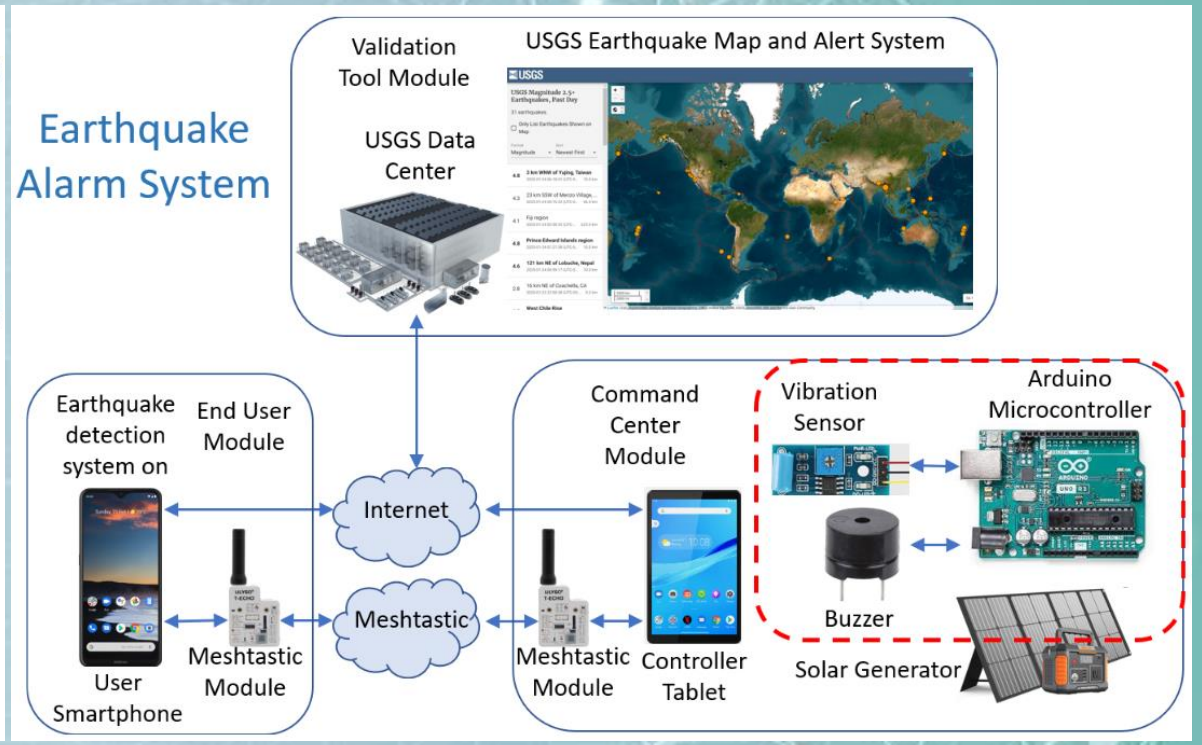
- Complete renewable energy-based food production system that includes vegetables, milk, egg and meat with no soil and no animais for colonization of other worlds

STEM Experiment on NASA RB09 Flight

- Plant seeds will be sent to space to study the effects of outer space radiation on their germination and growth rate
- Seeds will be sent in August of 2025 on NASA flight RB09 scientific balloon

Sustainable Environment Protection Solutions





Wildfire Alarm System

- Complete renewable energy-based wildfire detection with outdoor sensors, validation through NASA satellite fire detection and communication to the end user through normal Internet and cellphone services plus Meshtastic when those public services are not available
- Patent pending at the USPTO

Earthquake Alarm System

- Complete renewable energy-based earthquake detection with indoor sensors and integrated with the Wildfire Alarm System
- Both solutions also include an App for easy management and integration with AI for additional questions from the user

Complete Sustainable Food Production Comparison

Traditional Food Production				Sustainable Food Production		
						
						
Vegetables Rice, Peas, Carrots, Cabbage	Proteins Chicken, Pork, Meat, Eggs	Seafood Shrimp, Oyster	Ingredients	Vegetables Rice, Peas, Carrots, Cabbage	Proteins Chicken, Pork, Meat, Eggs	Seafood Shrimp, Oyster
Monoculture	Animal Farm	Fishing on the wild	Technology	Hydroponics Solar Energy	Precision Fermentation	Sustainable Farms
Water waste Chemical runoffs	Water waste Gas emission Animal cruelty	Reduced biodiversity	Results	No waste No runoffs Sustainable	No waste No emissions No animals Sustainable	Keep biodiversity Carbon capture Sustainable

Sustainable Environment Protection Solutions

Developed by Partners

- Beatriz Marcon from Cascavel, Brazil
    - Permeable Pavers: Cement pavers to be used in construction which are permeable and allow water to go through helping the drainage in urban areas
- GeneCodeLab from Accra, Ghana
    - Waste Management Innovation: Selective garbage process that enables recyclables to be separated before dumping in landfills
- Interact Club from Sao Paulo, Brazil
    - Combating the Poliomyelitis Worldwide: Work done together with the Rotary International to distribute collection sites in local commercial places to raise funds for the eradication of the poliomyelitis in the world
- Luis Gustavo Gomes from Vitoria, Brazil
    - Protecting the Marine Life with Arts: Art exhibition from the Students of the “Escola Estadual de Ensino Medio Irma Maria Horta” with the objective of preserving the local marine environment and biodiversity
- Julia Amorim from Vitoria, Brazil
    - Renewable Energy Garbage Collector: development of a renewable energy garbage collector with AI image recognition for the urban environment

Project Results – Part 1

Date	Session	Location	Student Coordinator	Directly Affected	Indirectly Affected
9/14/24	Knowledge transfer	Ajumako, Ghana	Nicole Haragutchi	2 teachers, 7 students	N/A
9/14/24	Knowledge transfer	Cascavel, Brazil	Nicole Haragutchi	1 adult, 1 student	N/A
9/15/24	Knowledge transfer	Cascavel, Brazil	Beatriz Marcon	2 adults, 1 student	Video on hydroponics available on YouTube
9/17/24	Knowledge transfer	Accra, Ghana	Nicole Haragutchi	1 teacher, 13 students	N/A
9/20/24	Knowledge transfer	Accra, Ghana	Nicole Haragutchi	1 teacher, 12 students	N/A
9/20/24	Knowledge transfer	Ajumako, Ghana	Nicole Haragutchi	1 teacher and 6 students	N/A
9/22/24	Knowledge transfer	Cascavel, Brazil	Beatriz Marcon	2 adults, 1 student	Video on permeable pavers available on YouTube
9/22/24	Prototype replication	Accra, Ghana	Nicole Haragutchi	1 teacher, 15 students	N/A
9/23/24	Knowledge transfer	Worldwide	Nicole Haragutchi	N/A	Video on Precision Fermentation available on YouTube
9/24/24	Knowledge transfer	Tagaytay, Philippines	Nicole Haragutchi	1 teacher, 60 students	N/A
9/24/24	Knowledge transfer	Cascavel, Brazil	Beatriz Marcon	1 adult, 1 student	Video on hydroponics available on YouTube
10/12/24	Knowledge transfer	Worldwide	Beatriz Marcon	Online conference/number of attendees impossible to get	Video of climate change in Brazil available on YouTube
10/12/24	Knowledge transfer	Worldwide	Luis Gustavo Gomes	Online conference/number of attendees impossible to get	Video of marine protection through the arts available on YouTube
10/12/24	Knowledge transfer	Worldwide	Interact Club	Online conference/number of attendees impossible to get	Video of poliomyelitis prevention available on YouTube

Project Results – Part 2

Date	Session	Location	Student Coordinator	Directly Affected	Indirectly Affected
10/12/24	Knowledge transfer	Worldwide	Nicole Haragutchi	Online conference/number of attendees impossible to get	Video of RISE Climate Solution Campaign available on YouTube
10/12/24	Knowledge transfer	Worldwide	Nicole Haragutchi	Online conference/number of attendees impossible to get	Video of Wildfire Alarm System available on YouTube
10/12/24	Knowledge transfer	Worldwide	Nicole Haragutchi	Online conference/number of attendees impossible to get	Video of Wildfire Alarm System at the SVIIF available on YouTube
10/12/24	Knowledge transfer	Worldwide	Nicole Haragutchi	Online conference/number of attendees impossible to get	Video of Sustainable Food Production on Mars available on YouTube
10/12/24	Knowledge transfer	Worldwide	Nicole Haragutchi	Online conference/number of attendees impossible to get	Video of Solution for Fast Fashion available on YouTube
10/13/24	Knowledge transfer	Worldwide	Teacher from Ajumako, Ghana	Online conference/number of attendees impossible to get	Video Innovative Garbage Management available on YouTube
10/16/24	Prototype replication	Tagaytay, Philippines	Nicole Haragutchi	1 teacher, 7 students	N/A
10/16/24	Knowledge transfer	Tagaytay, Philippines	Nicole Haragutchi	1 teacher, 60 students	N/A
10/19/24	Hands-on STEM Boot	Tallahassee, FL, USA	Nicole Haragutchi	80 visitors	N/A
11/3/24	Hands-on STEM Boot	Jacksonville, FL, USA	Nicole Haragutchi	120 visitors	N/A
11/5/24	Knowledge transfer	Accra, Ghana	Nicole Haragutchi	N/A	Homepage of our partnership available on the Internet
11/7/24	Knowledge transfer	Ajumako, Ghana	Nicole Haragutchi	N/A	Homepage of our partnership available on the Internet
11/19/24	Knowledge transfer	Accra, Ghana	Nicole Haragutchi	1 teacher	Teacher was going to provide students the information (about 20 students)

Project Results – Part 3

Date	Session	Location	Student Coordinator	Directly Affected	Indirectly Affected
11/20/24	Knowledge transfer	Vitoria, Brazil	Nicole Haragutchi	1 teacher	Teacher was going to provide students the information (about 30 students)
11/20/24	Knowledge transfer	Vitoria, Brazil	Nicole Haragutchi	N/A	Homepage of our partnership available on the Internet
11/22/24	Knowledge transfer	Liberia	Nicole Haragutchi	1 teacher, 10 students	N/A
11/23/24	Knowledge transfer	Indonesia	Nicole Haragutchi	Online conference/number of attendees impossible to get	N/A
12/1/24	Knowledge transfer	Worldwide	Nicole Haragutchi	Sustainable Food Production awarded 3rd place on Opportunity X Essay Contest	Not possible to calculate number of individuals indirectly affected
1/27/25	Knowledge transfer	Worldwide	Nicole Haragutchi	Sustainable Food Production awarded 1st place on NSS Live on a Healthy Space Design Competition	Not possible to calculate number of individuals indirectly affected

- All partners decided to make this an annual process with no end in sight
- We already have more 10 events planned for future delivery
- Details on all event results, photos and links to the video presentations are available at
  - https://www.innovationinternational.org/rise

Events Planned for Future Delivery

Date	Session	Location	Student Coordinator	Directly Affected	Indirectly Affected
3/26/25	Art Exhibit	Vitoria, Brazil	Luis Gustavo Gomes	Open art exhibit at the Irma Horta school in Brazil	N/A
4/01/25	Knowledge transfer	Tagaytay, Philippines	Nicole Haragutchi	Sustainable food Production project for a competition	N/A
4/02/25	Plant Distribution	Vitoria, Brazil	Julia Amoria	Distribution of plants to provide incentive for a greener world	N/A
4/12/25	Hands-on Booth	Jacksonville, FL, USA	Nicole Haragutchi	Participation in the Science Festival in Jacksonville, FL	N/A
4/12/25	Knowledge transfer	Worldwide	Julia Amorin	Online conference/number of attendees impossible to get	Video of Solution for solar powered garbage collector will be available on YouTube
4/12/25	Knowledge transfer	Worldwide	Nicole Haragutchi	Online conference/number of attendees impossible to get	Video of Solution for STEM in space will be available on YouTube
4/12/25	Knowledge transfer	Worldwide	Luis Gustavo Gomes	Online conference/number of attendees impossible to get	Video of Solution for Marine Protection through the Arts will be available on YouTube
4/12/25	Knowledge transfer	Worldwide	Swasti Timande	Online conference/number of attendees impossible to get	Video of Solution for Solid-Stage Air Conditioning will be available on YouTube
4/15/25	Knowledge transfer	Tagaytay, Philippines	Nicole Haragutchi	Security drill with flashlights for students with special needs	N/A
4/22/25	Knowledge transfer	Accra, Ghana	Nicole Haragutchi	Class on Sustainable Food Production	N/A

- Details on all event are available at
  - https://www.innovationinternational.org/rise

RISE Climate Solutions Campaign Partners

Schools Developing Joint Solutions

- Grades of Green in USA
- Innovation International in Saint Augustine, FL, USA
- Centro Universitario da Fundacao Assis Gurgacz in Cascavel, Brazil
- Escola Estadual de Ensino Medio Irma Maria Horta in Vitoria, Brazil
- Interact Club from Rotary International in Sao Paulo, Brazil
- GeneCodeLab in Accra, Ghana
- Greater Grace Child and Youth Development Center in Ajumako, Ghana
- Tagaytay City Special Education Center in Cavite, Philippines

Commercial Partners

- Eat Your Yard JAX Farm in Jacksonville, FL, USA
- Harmony Mushrooms Co. in Jacksonville, FL, USA
- Marcon Pavers in Cascavel, Brazil
- Hidroponia Paravisi in Cascavel, Brazil

Information Sharing and Event Organizers

- Innovation World for the Global Innovation Field Trip in USA
- Krya for International Kids Conference in Indonesia
- Future of Education Technology Conference in the USA
- Tallahassee State College for the Tallahassee Science Festival
- Jacksonville Science Festival in the USA
- Persimmon Festival in Jacksonville, USA
- Jacksonville's Museum of Science & History for the Jacksonville Science Festival in the USA
- British International Education Association for the Sustainable Food Production program with the Tagaytay City Special Education Center in the Philippines
- National Space Society for the Live in a Healthy Space Competition in the USA
- Opportunity X for the Essay Competition in the USA

Innovative Cyclical Process

This process guarantees the perpetuation of the process and the partnerships

1. Innovation incubation
   - Brainstorming
   - Development of a new solution
2. Innovation building
   - Prototype creation
   - Prototype replication
3. Innovation sharing
   - Conferences
   - Science Festivals
4. Innovation validation
   - Competitions
   - Grants

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Additional Information

- For additional information such as
  - Photos
  - Videos and video links
  - Complete planning process
- Visit the RISE Climate Solutions Campaign homepage at:
  - https://www.innovationinternational.org/rise
- Thank you

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