



**THE OHIO STATE UNIVERSITY**

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# **Earth Day 2021: Restore Our Earth**

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# EARTH DAY 2021: RESTORE OUR EARTH

- By restoring ecosystems through **sequestration of atmospheric CO<sub>2</sub> in world soils and forests** and making science-based management of soils and agriculture the drivers to advance Sustainable Development Goals of the Agenda 2030 of the United Nations.
- By strengthening humanity's connection to the Earth and **enhancing awareness about its responsibility to limiting anthropogenic activities within the planetary boundaries.**
- By strengthening humanity's resolve to address the Covid Pandemic and understand the significance of the **One Health Concept: "The Health of Soil, Plants, Animals, People, the Environment and the Planet is One and Indivisible."**



# EARTHWORM: THE ECOSYSTEM ENGINEER

“It may be doubted if there are any other animals which have played such an important part in the history of the world as these lowly organized creatures.”

– *Charles Darwin (1881)*



# HUMAN IMPACT ON THE GLOBAL C CYCLE

## I. Land Use Change and Agriculture

8000 BC to 1750 = 320 Gt

1750 to 2019 = 255 Gt

**Total = 755 Gt**

**Emissions from Soil = 133 Gt**

## II. Fossil Fuel Emissions

1750 to 2019 = 445 Gt

## III. Total Emissions from 1750 to 2019 = 700 Gt

Land Use Change and Agriculture = 36%

Fossil Fuel Combustion = 64%



# FATE OF ANTHROPOGENIC EMISSIONS: 1750 - 2019

Atmosphere = 205

Oceans

**Making Agriculture a Solution to Global Warming  
by Translating Science Into Action**

**= 230 Gt**

Other

**= 20 Gt**



# RESEARCH PRIORITIES

## A. Primary Data on Soil Carbon Stock and Flux

- i. Soil Health
- ii. Productivity
- iii. Use Efficiency
  - National Projects : FFAR
  - International Program : Consortium

## B. In-Field Assessment of Soil Carbon

- i. Hand-held device
- ii. Drone-based sensors
- iii. Remote sensing and satellite imaging



# TRANSLATING SCIENCE INTO ACTION

## A. Role of Agricultural Extension

## B. Policy Interventions

- Growing Climate Resolution 2020
- Farm Bill 2023

## C. Farming Carbon

- Trading C-Credits
- Payments for Ecosystem Services



# SANTA BARBARA OIL SPILL

- On January 28, 1969, a well off the coast of Santa Barbara, California, blew out, and >3M gallons of oil spilled.
- The spill killed more than 10,000 seabirds, dolphins, seals, and sea lions.
- Senator Gaylord Nelson from Wisconsin was inspired to create “Earth Day” upon seeing the Santa Barbara Channel 800 square mile oil slick from an airplane.



# **SANTA BARBARA ENVIRONMENTAL RIGHTS DAY**

- **On the first anniversary of the oil spill (1/28/1970), Environmental Rights Day was created, and the Declaration of Environmental Rights was read.**



# HISTORY OF THE “EARTH DAY”

- **1969:** At a UNESCO Conference in San Francisco, John McConnell proposed a day to honor the Earth and concept of peace, to be observed on the first day of Spring in the Northern Hemisphere.
- The day of nature’s equipoise was sanctioned in a proclamation written by John McConnell, a peace activist, and signed by Secretary General U. Thant at the United Nations.
- **22<sup>nd</sup> April 1970:** Senator Gaylord Nelson proposed the idea to hold a nationwide environmental “teach-in” on April 22<sup>nd</sup>, 1970. The Senator appointed Denis Hayes to be the national coordinator. Nelson and Hayes renamed the event “Earth Day.”



# INTERNATIONALIZATION OF THE EVENT

- **The first Earth Day was focused on the United States.**
- **In 1990, the event internationalized, and 141 countries participated.**



# THE PARIS AGREEMENT

- **On Earth Day 2016, the Paris Agreement was signed by the United States, China, and 120 other countries.**
- **The climate protection treaty, launched at COP21 in Paris in 2015, was adopted by consensus of 195 nations.**



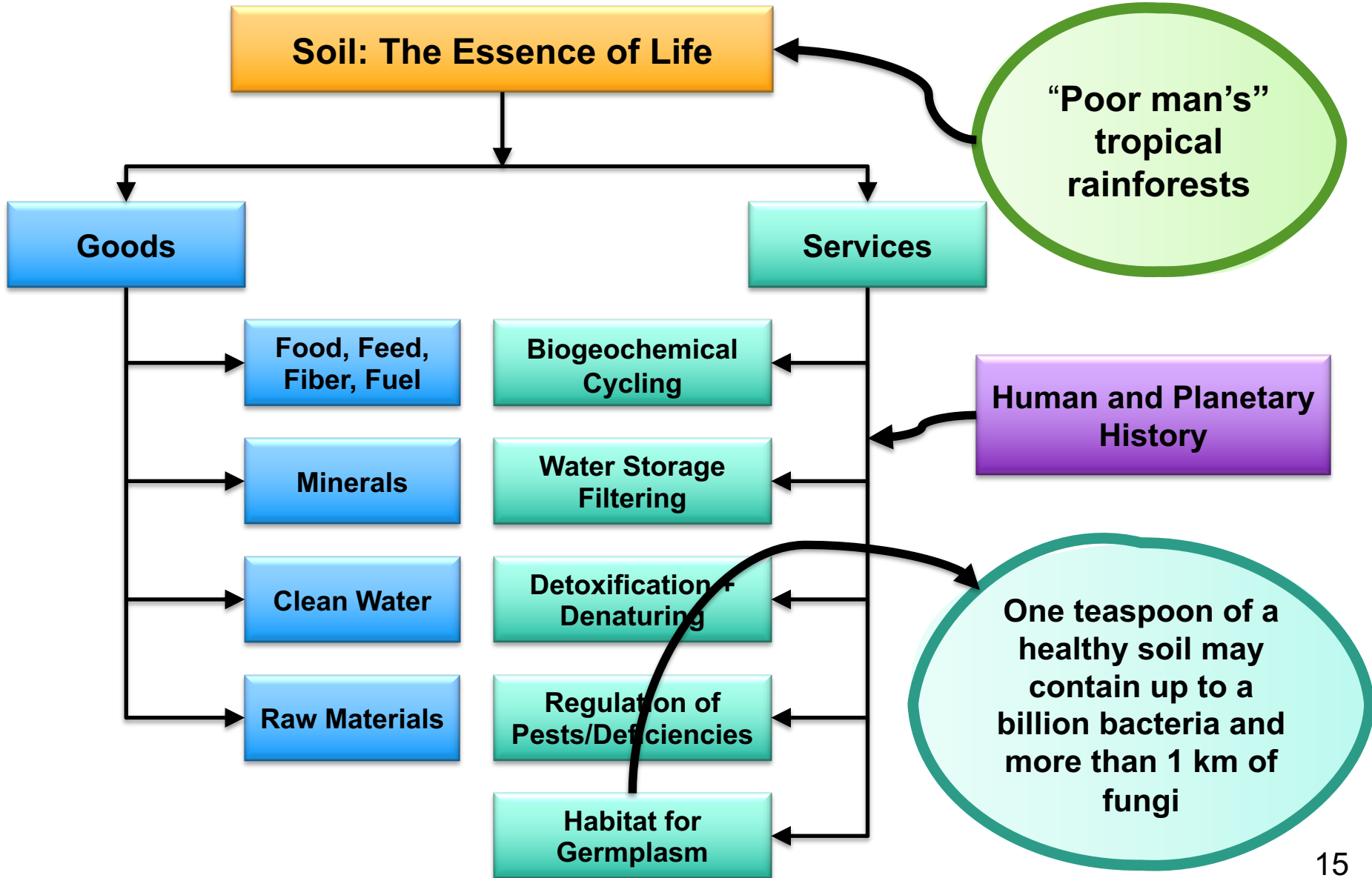
# 50<sup>TH</sup> ANNIVERSARY OF EARTH DAY

- Earth Day 2020 celebrated its 50<sup>th</sup> anniversary and over 100 million people observed the event.
- This was the largest online mass mobilization in history.



## NEW SOIL FORMATION

**It may take 100 years to build 5 mm of soil, but only a moment to destroy it by treating it like dirt.**





# Managing Green Water Storage in the Root Zone

