UN DAY

October 5th 2018

Green Technology - Agriculture

This year's Theme is Green Technology. Green technology can be defined as the application of science to mitigate or reverse the effects of human activity on the environment. Examples being renewable energy, water purification and solid waste management. The main goal of green technology is to be sustainable, meeting the needs of the present without the compromising the ability of future generations to meet needs of their own.

There is no doubt that pollution is a big problem that needs to be addressed, with the active use of cleaner technology it can help reduce the negative impacts that it will have on our environment. The benefits of this type of technology will not only be for nature itself but it also allows for a clean and greener human lifestyle. Therefore, we are going to be exploring the theme of green technology because we believe that it is essentially for the OSC community to know about its effects and at the same time play our part in helping the planet become sustainable.


INABLE
RICULT

Causes of Global Warming

Methane and CO_2 collecting in the atmosphere.

Heat is trapped inside the atmosphere by the methane and CO_2.

Increase heat causes rise in global temperature.

Dangers of Global Warming

Extreme weather.

Ice melts, sea level rises.

Disrupts food supplies

Temperature rises

Disrupts plants and agriculture

IMPACTS OF CLIMATE CHANGE

By **2030**, nine out of 10 of the major crops will experience reduced or stagnant growth rates, while average prices will increase dramatically as a result, at least in part, due to climate change.

MAIZE

12%

GROWTH RATE DECREASE

90% PRICE INCREASE

RICE

23%

GROWTH RATE DECREASE

89% PRICE INCREASE

WHEAT

13%

GROWTH RATE DECREASE

75% PRICE INCREASE

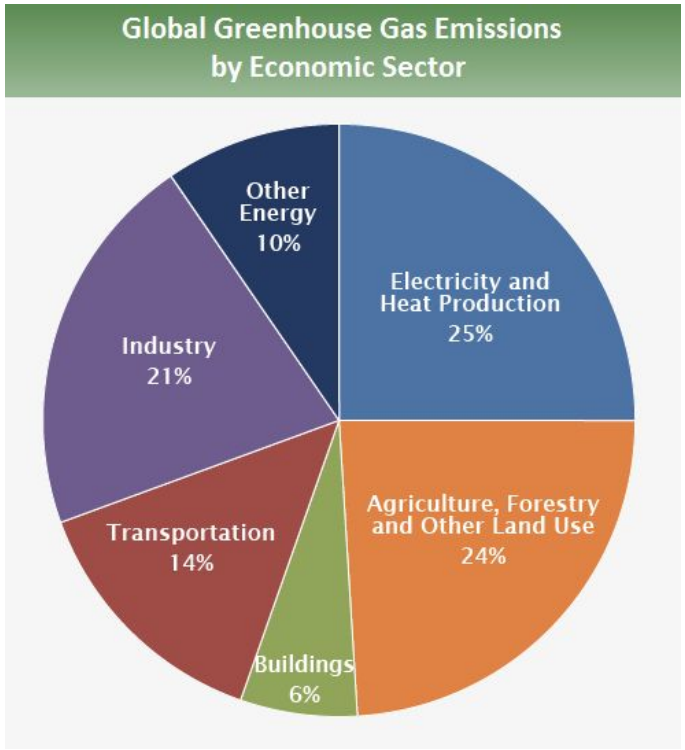
OTHER CROPS

8%

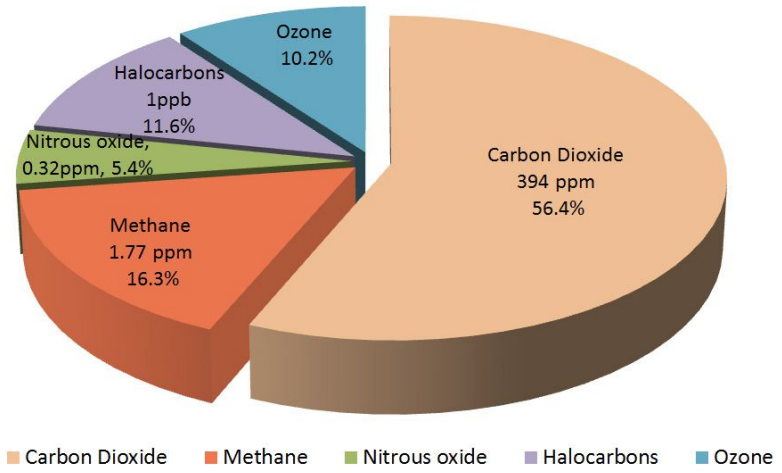
GROWTH RATE DECREASE

83% PRICE INCREASE

How is Agriculture Impacting Climate Change

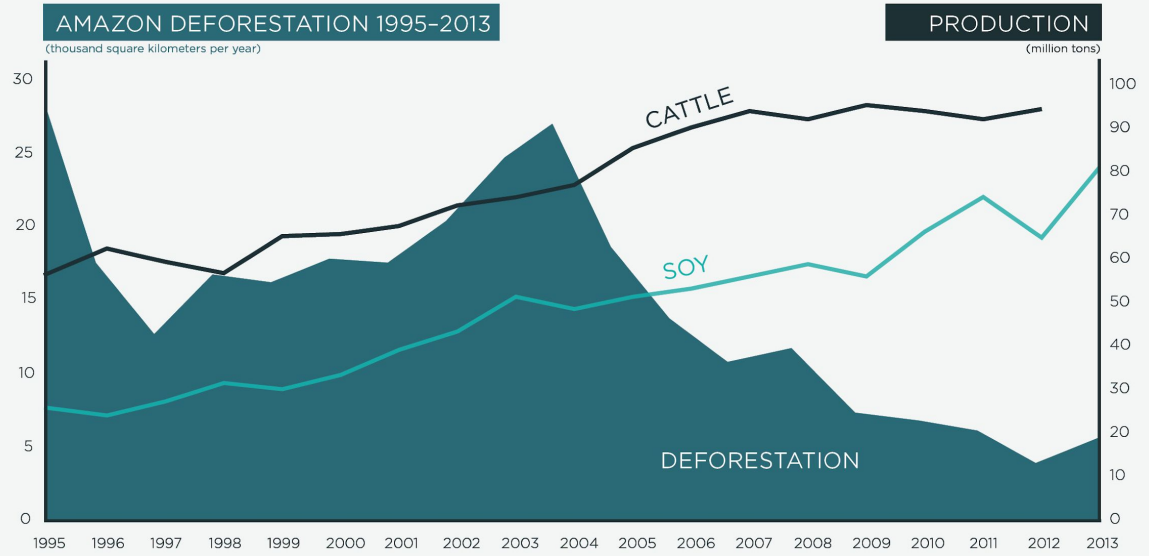


Methane is roughly 30 times more potent than Carbon Dioxide...



There is Still Hope

Brazil reduced deforestation and increased food production at the same time



Source: PRODES, FAOSTAT.

Center for Global Development


SUSTAINABLE DEVELOPMENT GOALS
1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS
SUSTAINABLE DEVELOPMENT GOALS

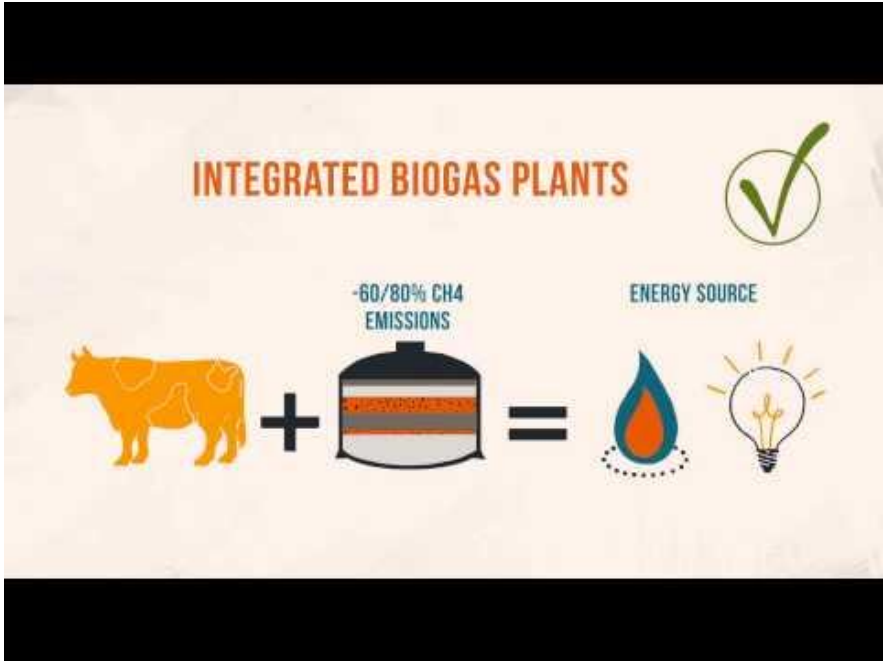
Goal 15 :
Life on Land

Goals

- By 2020 - Ensure the protection of inland freshwater ecosystems such as forests, wetlands, mountains and drylands etc.
- By 2030 - Promote the restoration of such ecosystems.
- By 2030 - Promote anti-deforestation legislation in nations.

This also ties into goal 13, climate action.

Doing More with Less



Discuss:

Why is the idea of “Doing more with Less” important in this context?

Genetically
Modified
Organisms

What are GMOs

Genetically Modified Organisms

Advantages:

- Requires less resources
- More Output
- Overall more efficient
- Less space for more output

Disadvantages:

- Agricultural weapon
- Invasive species
- Rogue mutations

Discuss:

How do GMOs help reduce the effects of climate change?

Agricultural Digitization

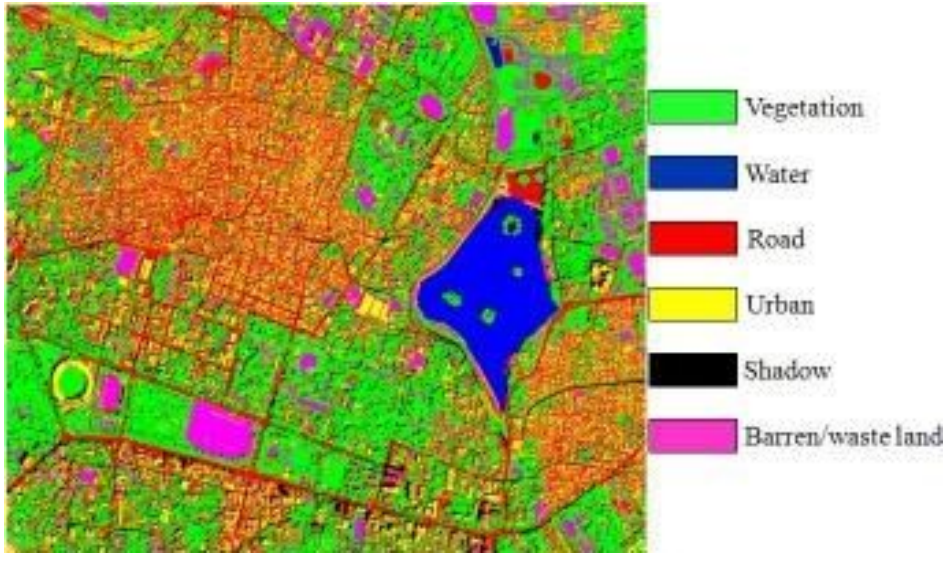
Agricultural Digitization - Hardware

Digital hardware components can greatly increase efficiency in agriculture through automation, this allows for

- Automated seeding, watering and tractoring
- Reduced labor costs
- High regularity
- Larger workforce

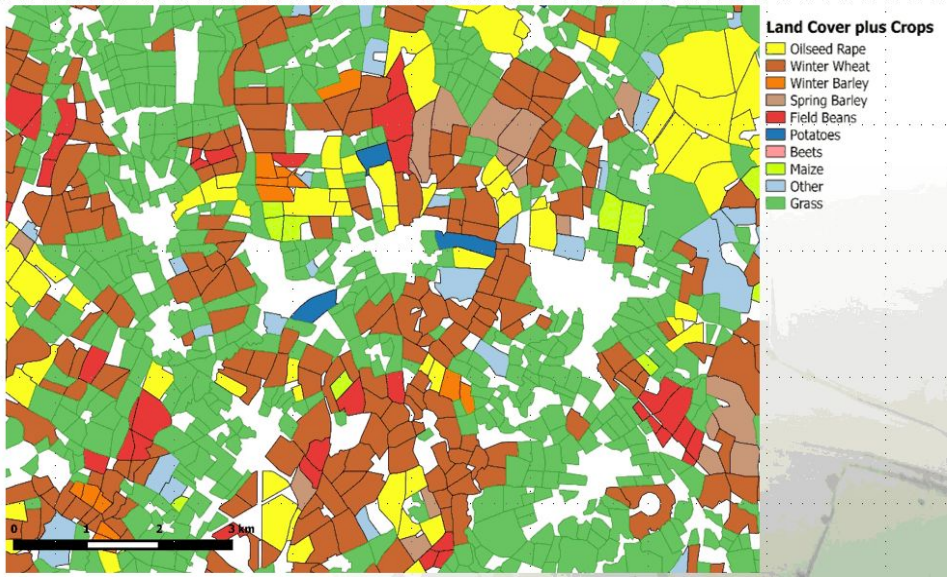
Agricultural Digitization - Software

Big data is collected taking in weather, historical data, economical, topology, crop vital signs etc.



Agricultural Digitization - Software

Machine Learning use this data to provide valuable, personalized insights to farmers.



a. Ideal crops by time and location
b. Harvest life cycle advice
c. Future Prices
d. Diagnose pests and Diseases

Agricultural Digitization - Software

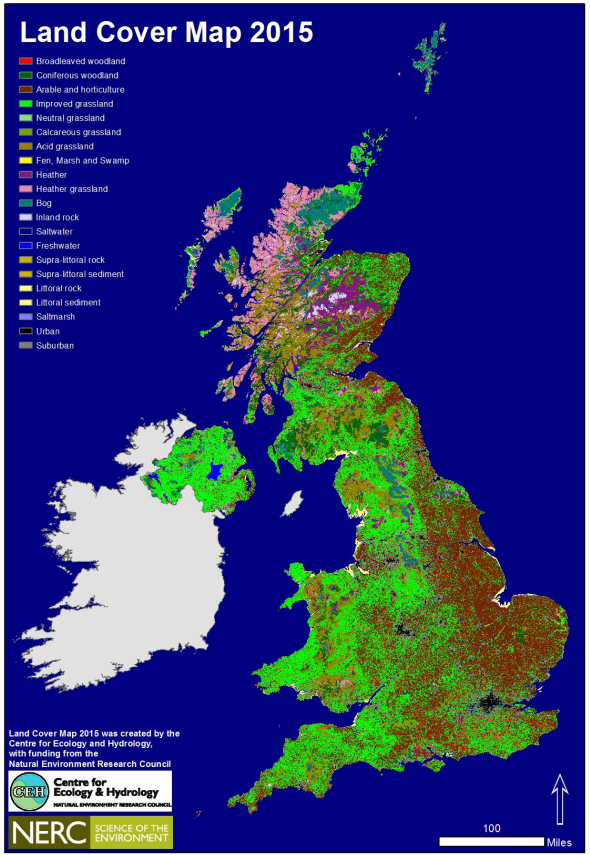
Efficiency only

increases as more data

is used and more

farmers join the

system…



Agricultural Digitization - Software

Agricultural Digitization

Advantages:

- Increase in productivity
- Greater food traceability
- More economic security for farmers

Disadvantages:

- Vulnerable to cyber-attacks
- Data privacy issues
- Decrease in employment

Smart GreenHouses

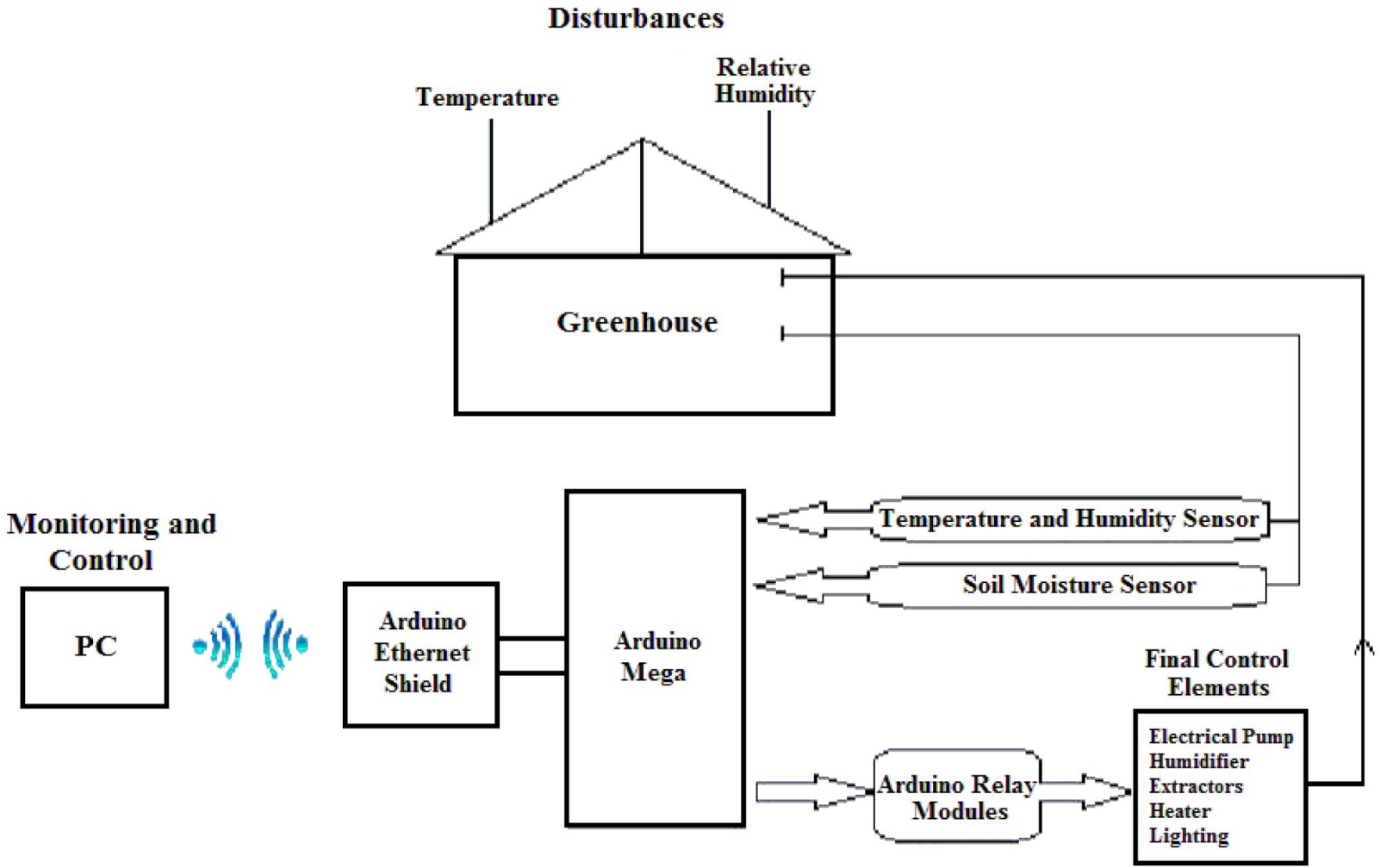
Smart Greenhouses

Discuss:

What are Smart GreenHouses?

Smart Greenhouses

- Controlled, highly space efficient environments to limit irregularities
- Real time data is collected from sensors (humidity, temperature, soil moisture, etc.)
- The data is analyzed and the environment is adjusted based on the ideal environment for the crop
- Through aquaponics, resource efficiency can be further increased


Disturbances
Temperature
Relative Humidity
Greenhouse
Monitoring and Control
PC
Arduino Ethernet Shield
Arduino Mega
Temperature and Humidity Sensor
Soil Moisture Sensor
Final Control Elements
Arduino Relay Modules
Electrical Pump
Humidifier
Extractors
Heater
Lighting

Smart Greenhouses

Advantages:

- Increase in productivity
- Maximum utility of resources
- High economic security for farmers

Disadvantages:

- High initial investment
- Maintenance costs
- Energy Costs affect profitability

Livestock Management Systems

Livestock Management Systems

Livestock are a major contributor of GHGs

- One cow produces over 250 liters of methane

Through inbuilt tracking systems in livestock we can monitor

- Their heart rates and other vital signs
- Fertility
- Milk quality and possible quantity

This data can help diagnose diseases early and also monitor efficiency of livestock.

Livestock management Systems

Advantages:

- Increase in productivity/profitability
- Increase in traceability
- Quality of produce will be higher

Disadvantages:

- Vulnerable to cyber-attacks
- Decrease in employment
- High initial investment

Questions?

Agriculture in the near Future

Reflection

Divide the class into groups of 3 and Write your group's reflection on poster paper

- What is the most interesting thing you learnt?
- What similarities are there between the technologies you learn about
- How can you incorporate what you learnt into your daily life?

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