Smart Agric-Innovating Agriculture Economy in the Production of Cut Flowers

TSINGHUA UNIVERSITY CERTIFICATE PROGRAM – INNOVATION & ENTERPRENEURSHIP FOR DIGITAL ECONOMY

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GROUP: 30

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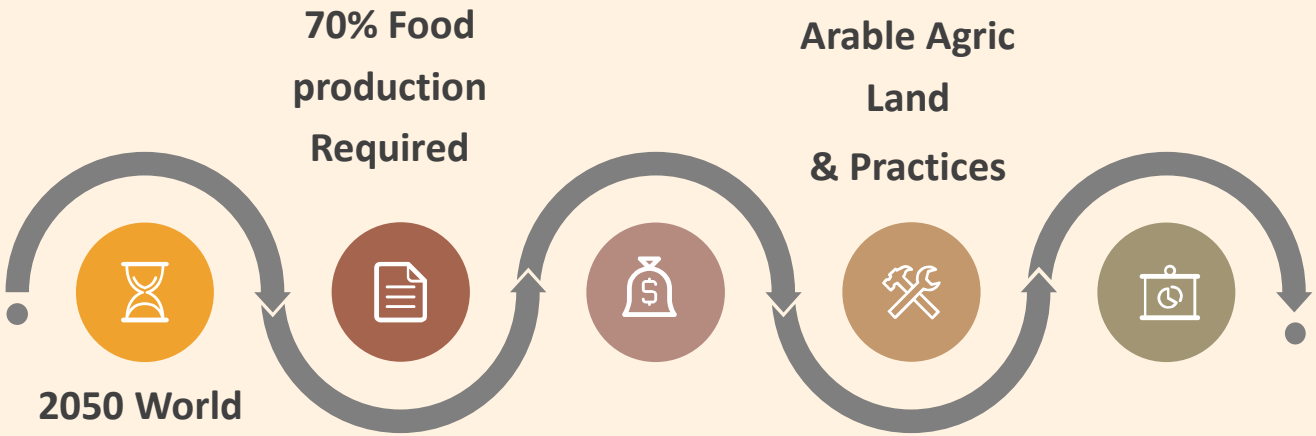
- ✓ Introduction
- ✓ What is Smart Agric?
- ✓ Environmental Impacts of cut flowers productions (Worldwide)
- ✓ Robustness against climatic change
- ✓ Cost Benefit Analysis & Policy framework

Introduction

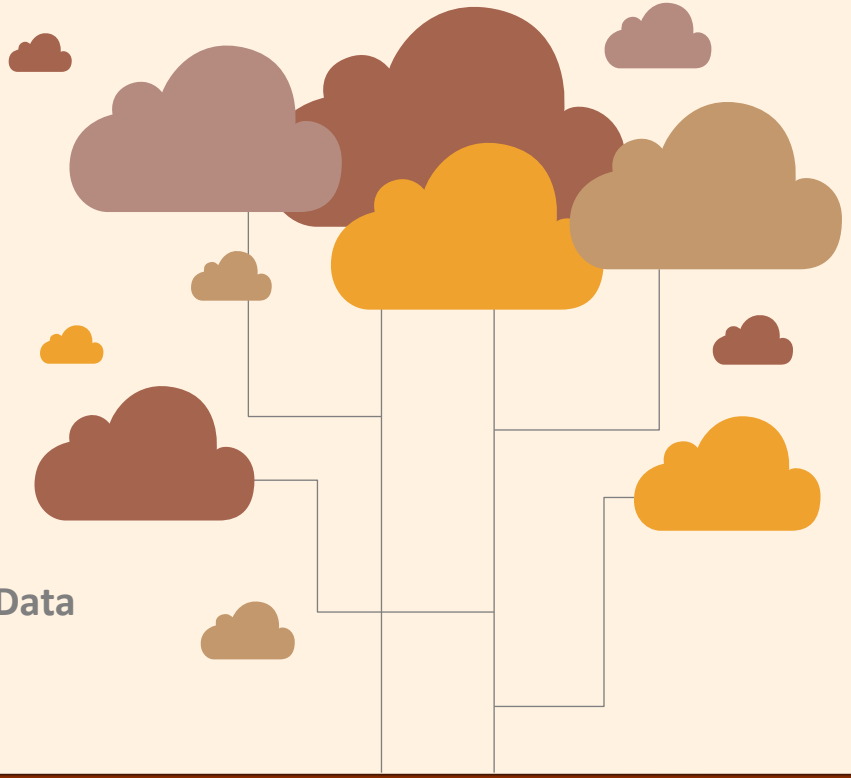


What is Smart Agric?

Application of IoT solution in Agriculture

Agric IoT device installation to Hit 75 million in 2020 At 20% AGR

IoT + Automation + Big Data



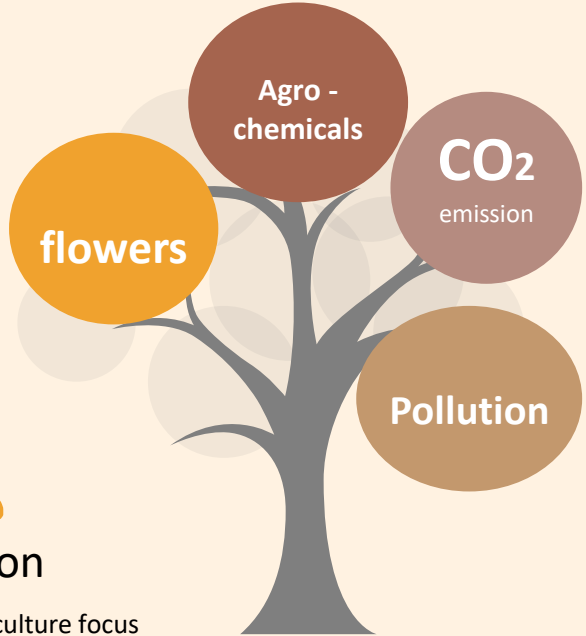
Constant Growing adoption of IoT solution in Agriculture

Global Smart Agric Market expected to triple by 2025 to $15.3 Billion

Environmental impacts on cut flowers production

Flowers are invaluable

to all mankind and boost economies.



The high use of agrochemicals

both (developed and developing nations) causes:

- ✓Detrimental to workers health
- ✓air, water and soil contamination
- ✓Endanger pollinators' populations
- ✓Eutrophication

Pollution

our innovative agriculture focus on getting high yield, less time and minimize pollution

High CO2 production

- ✓production, processing and transporting.
- ✓Climate change

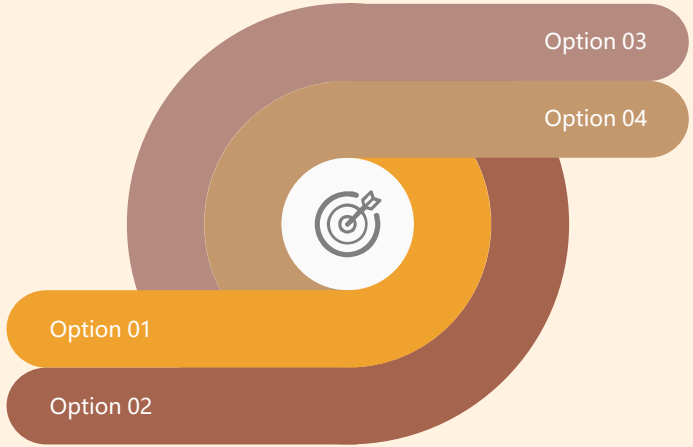
Robustness against climatic change

01

Temperature

02

Acidification, UV-B radiation



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CO2, Precipitation

04

Sea-level rise

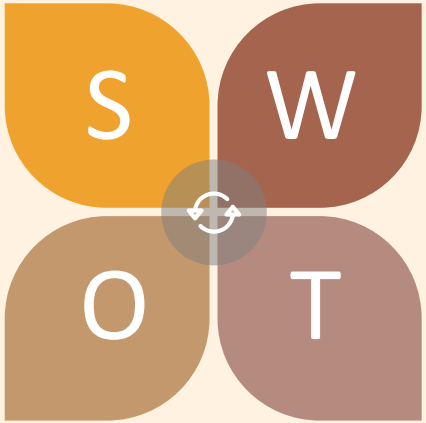
Cost Benefit Analysis & Policy framework

Strengths

- ✓ Efficiency
- ✓ Quality
- ✓ Customer Responsiveness

Opportunities

- ✓ Environmental
- ✓ Economic (Niche Safety food)
- ✓



Weakness

The high use of agrochemicals both (developed and developing nations) causes:

- ✓Detrimental to workers health
- ✓air, water and soil contamination
- ✓Endanger pollinators' populations
- ✓Eutrophication

Threats

- ✓ Technology
- ✓ Social & Economic
- ✓ Economic barrier
- ✓ Political

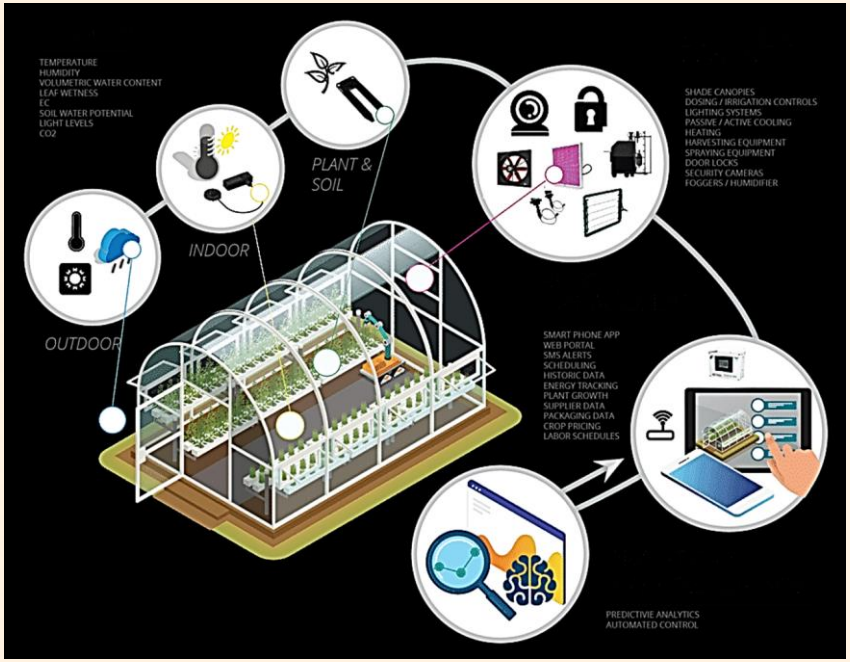
02

PART TWO

Approaches

- ✓ Multiplatform IoT
- ✓ Big Data techniques
- ✓ Sensor Technology
- ✓ Machine Learning / AI
- ✓ Blockchain

Multiplatform IoT

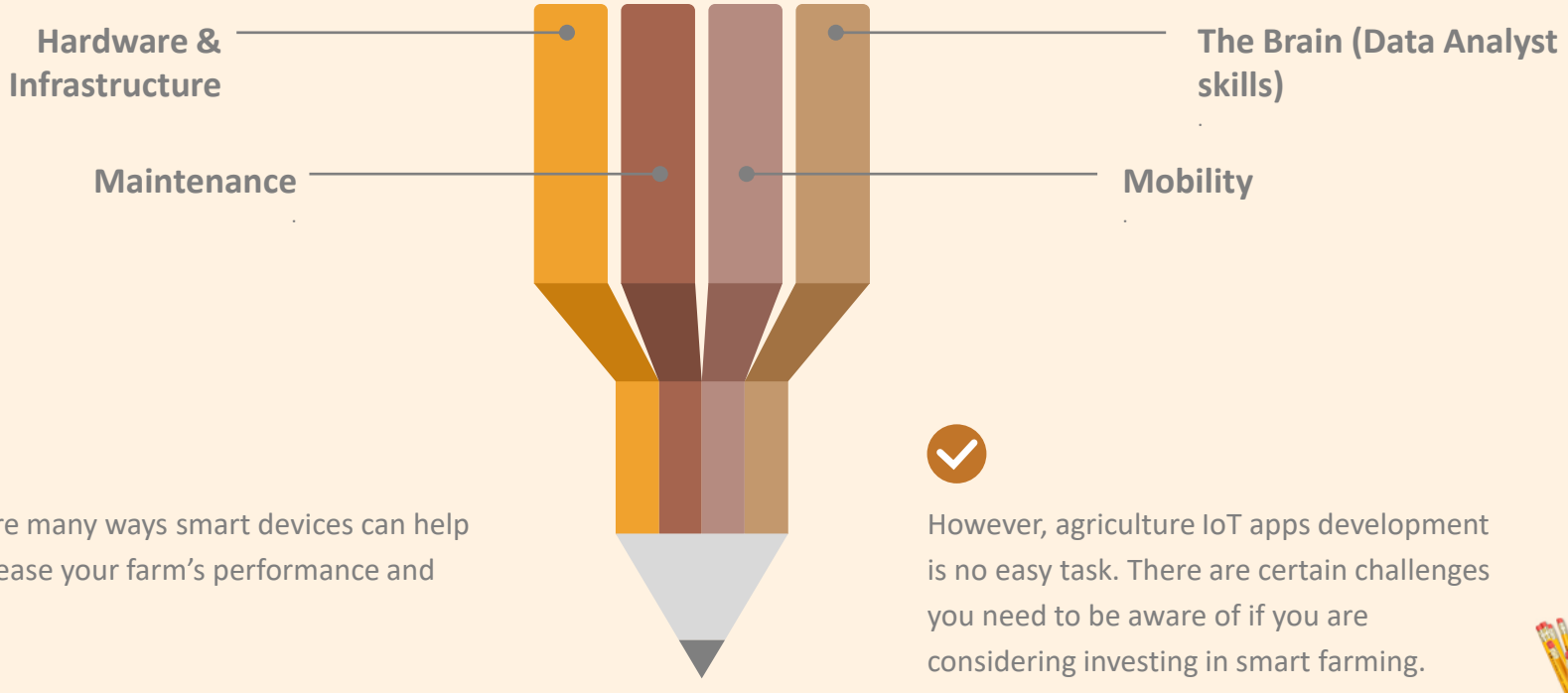


Greenhouse Smart Control System

- Check greenhouses anytime, anywhere.
- Real-time data about air temperature and humidity, soil temperature and humidity, as well as CO2 and sunshine, etc.
- Turn on/off ventilation, irrigating pumps anytime required
- Check temperature and humidity curve
- Set different parameters for better daily management

Multiple applications promoting Big Data

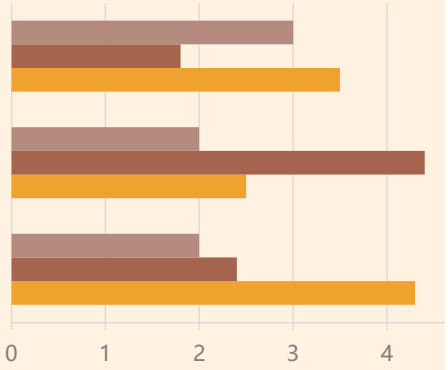
Things to Consider in Development of a Smart Farm

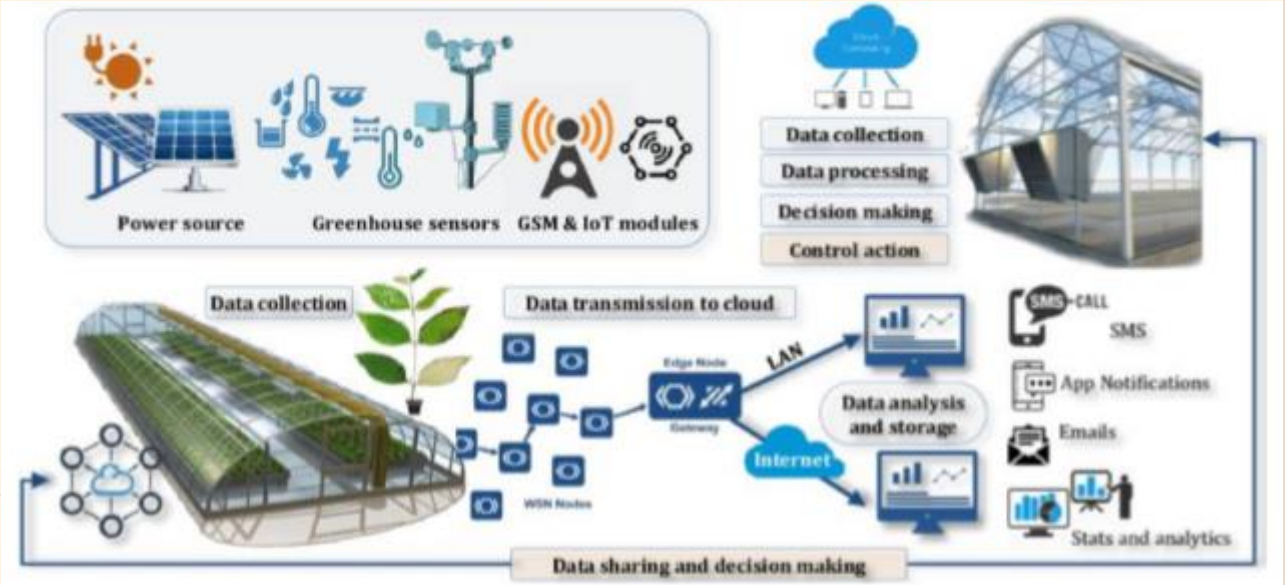


There are many ways smart devices can help you increase your farm’s performance and revenue

However, agriculture IoT apps development is no easy task. There are certain challenges you need to be aware of if you are considering investing in smart farming.

Big Data Techniques





Data from the green house needs to be extracted through various means. This involves methods and processes for collecting and accumulation of Agricultural productions data from a controlled environment.

Big Data Techniques

Data Collection

Sensors, Agric Machinery and Software

Data Analytics

Data mining: K-means, K-medoids PAM, CLARA and CLARANS

Data Presentation

API consumption, visualization and forecast

Data Utilization

Disease, Yield and Quality prediction .

Relevance of Big Data Techniques

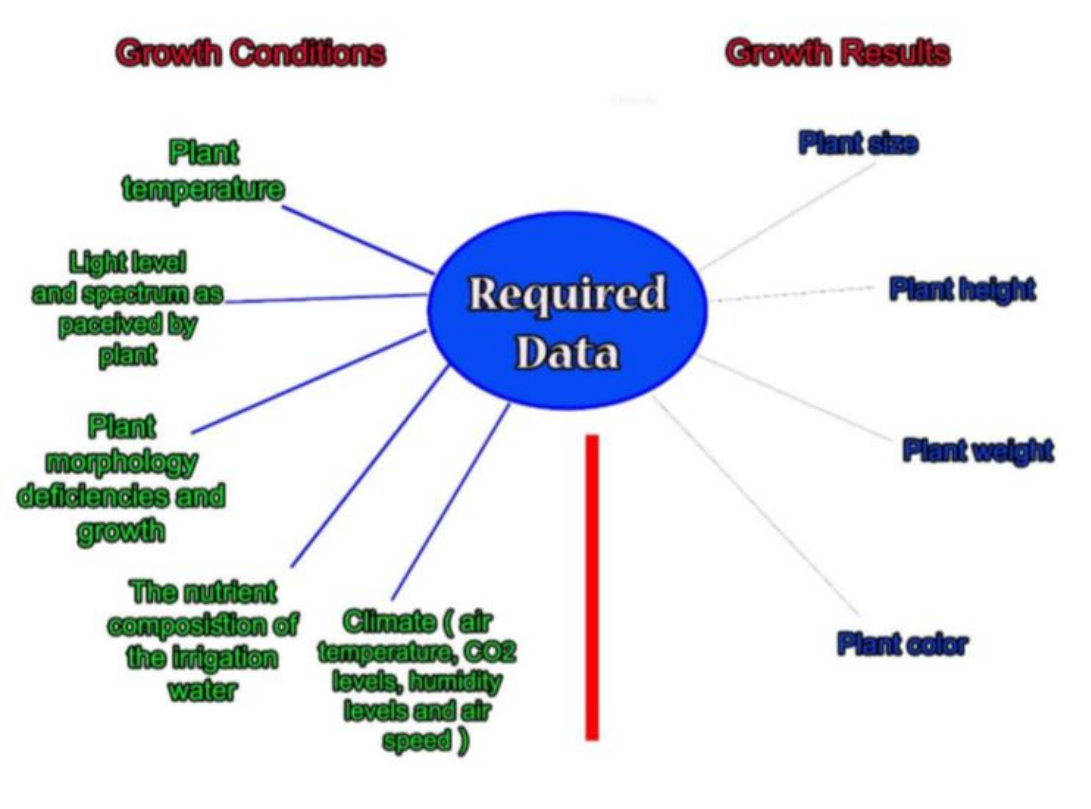
20% Better supply chain management

Boosting productivity and innovation . 15%

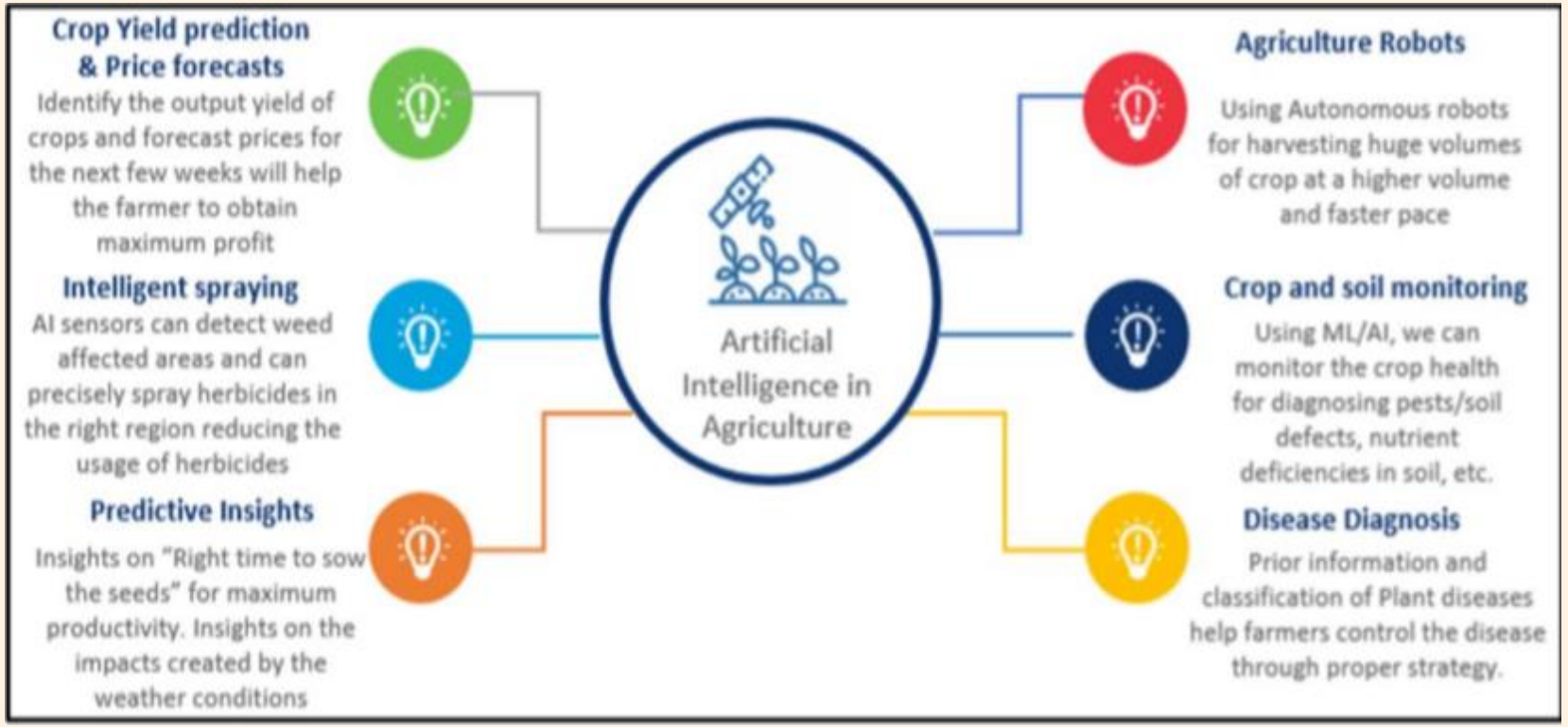
25% Cost savings and business

Managing environmental challenges 40%

Role of Sensors & Data Collection



Machine Learning & AI



Blockchain Role

Storage

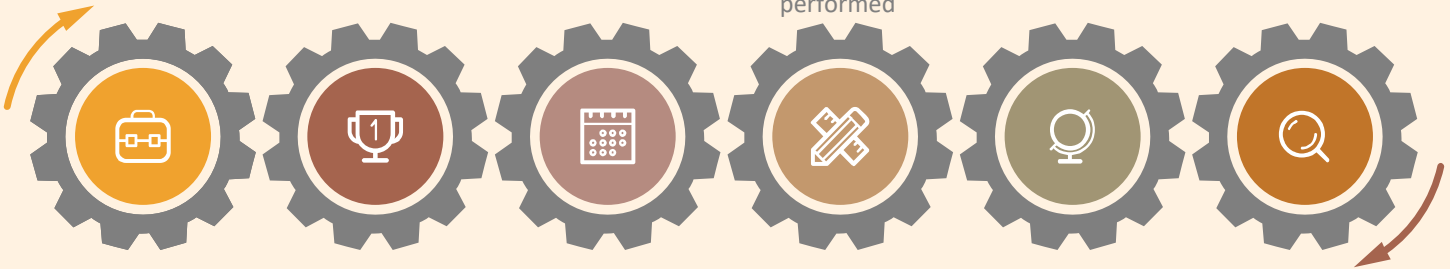
payments, orders, delivers, and other sensitive information are digitized and stored

Finance

all financial transactions and virtual currency transfers between farmers and consumers can performed

Monitoring

Data Presented



Transactions

farmers and stakeholders able to easily buy and sell several goods

Communication

the farmer and consumers can build the connections patterns

Remit

the real time remittances issued to the farmers can be transferred.

03

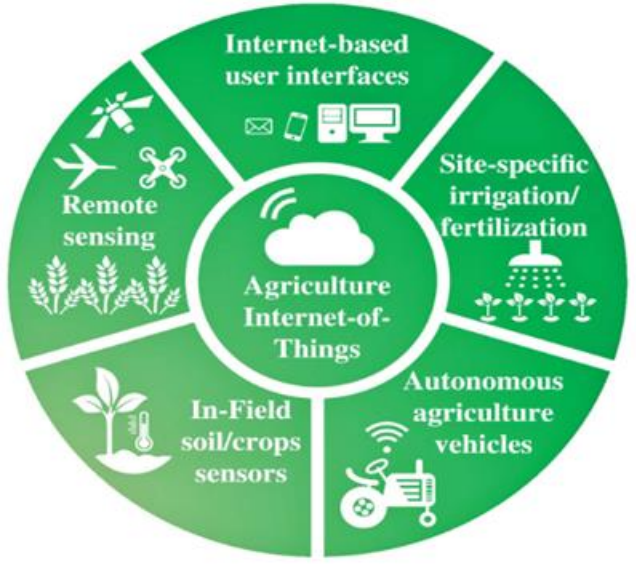
PART THREE

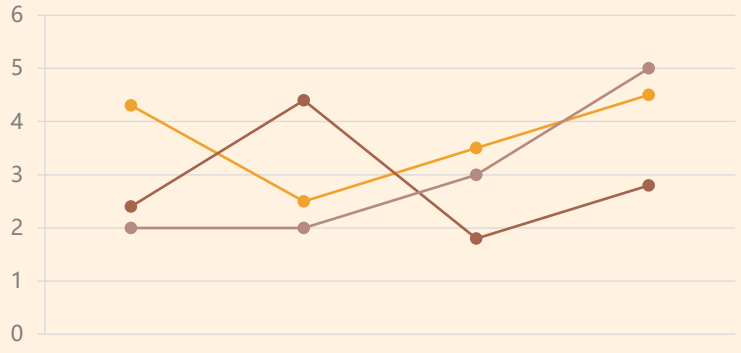
CONVERGENCE OF TECHNOLOGY

- ✓ Benefits of Smart Farming
- ✓ Smart Greenhouse Farming
- ✓ Vertical Farming (VF) in Greenhouse
- ✓ Technological Convergence in Smart Farming

Smart Greenhouse Farming

the integration of information and communication technologies and sensors into farm equipment for use in crop cultivation and food production system

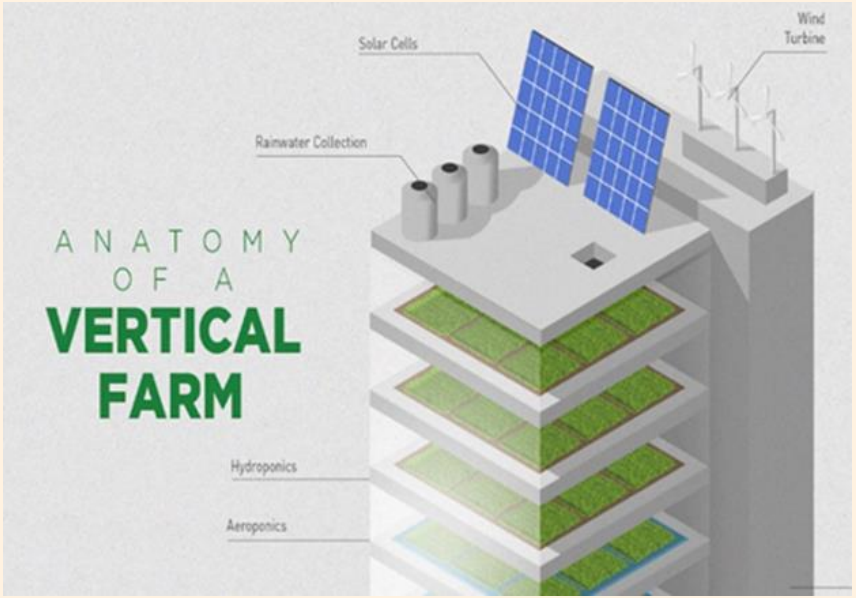




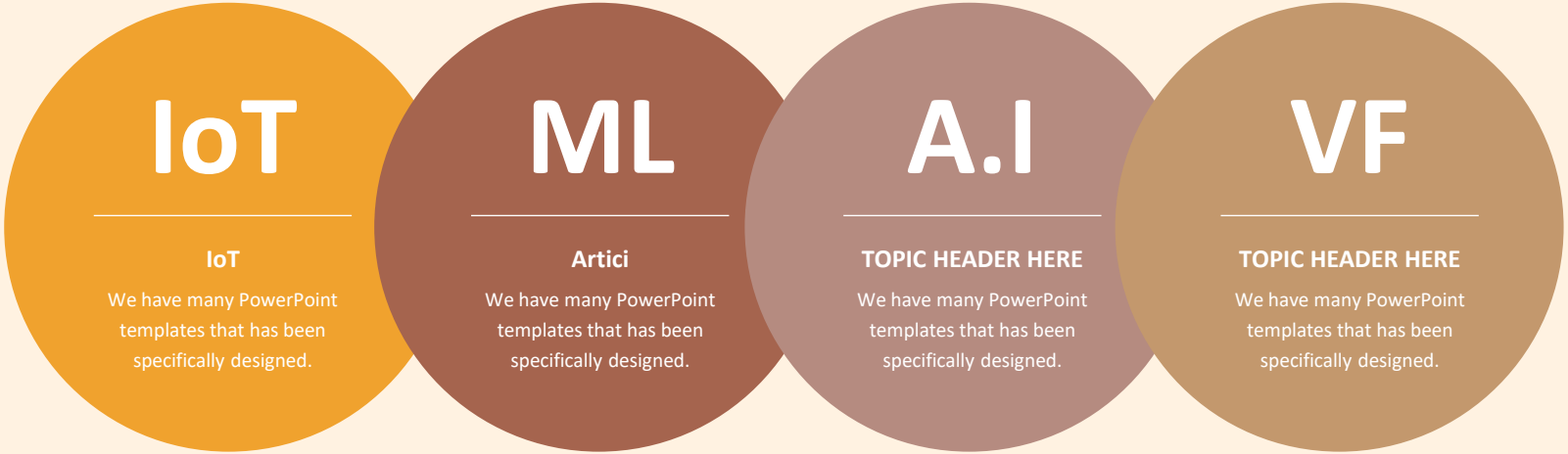
Benefits of Smart Farming

- Provides convenience, efficiency and simplicity.
- Bridges digital divides and brings new opportunities to meet developmental goals
- With Standardization, TC enables transparent and modular communication between different products.
- Helps in collecting a lot of data on crops, which can be helpful to make better decisions when analyzed
- Allows farmers to maximize yields using minimum resources such as water, fertilizer, seeds, etc.
- Delivering of high-quality crop production
- It helps for complete visualization of operations, i.e. farmers can monitor soil moisture, weather, equipment,

Vertical Farming (VF) in Greenhouse



Converged Technologies used in Smart Agric



IoT

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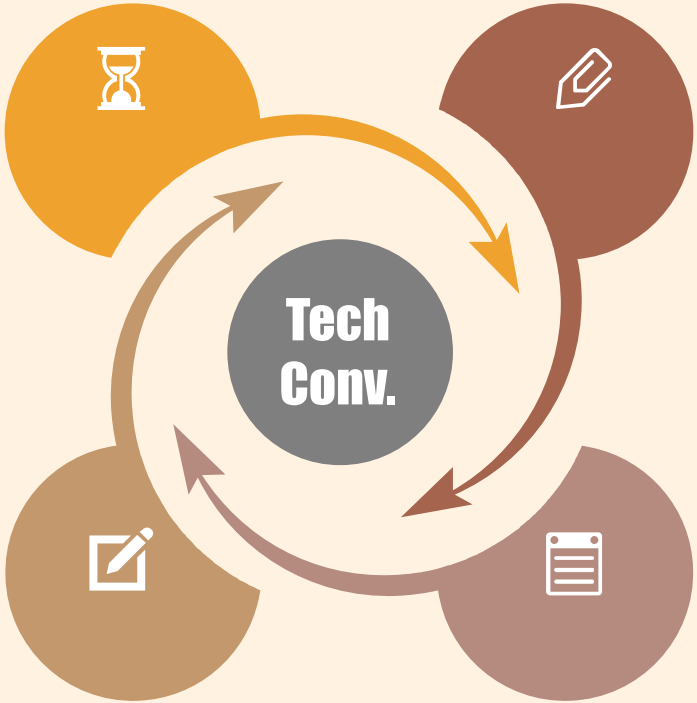
integration of two or more different technologies in a single device or system.

Converged Technologies Benefits in Smart Agric

It provides a huge opportunity for the development of new value-added services. It as well provides convenience, efficiency, and simplicity.

It bridges the digital divide and brings new opportunities to meet development goals as a single service provider can offer different products and services.

Technological convergence alone with standardization enables transparent and modular communication between different products over the network and the possibility of delivering a broader set of them.



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PART FOUR

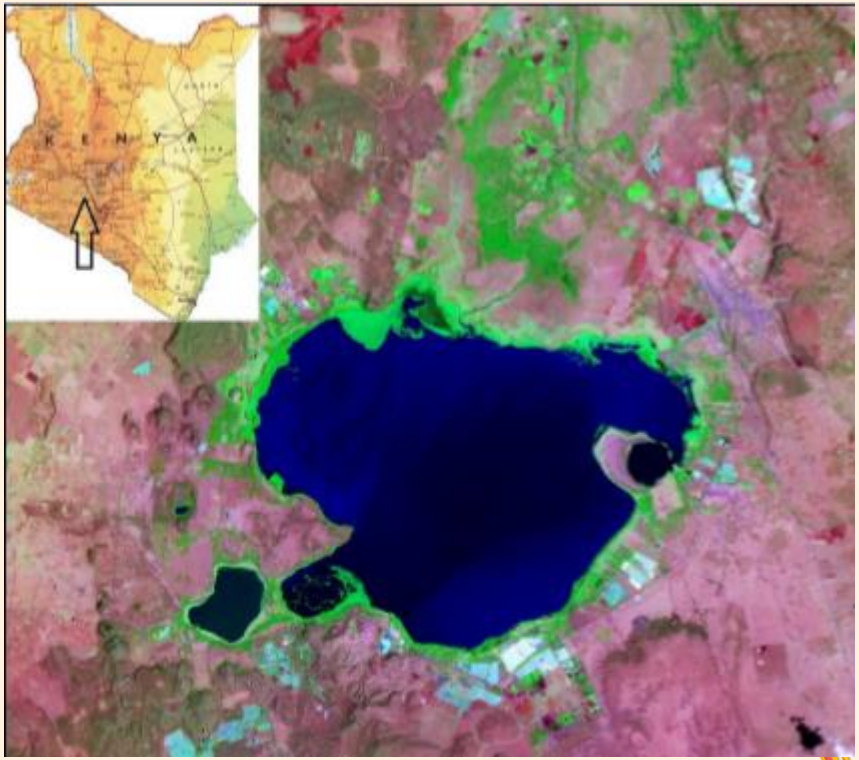
CASE STUDY

- ✓ **Cut Flowers production in Kenya**

Case Study

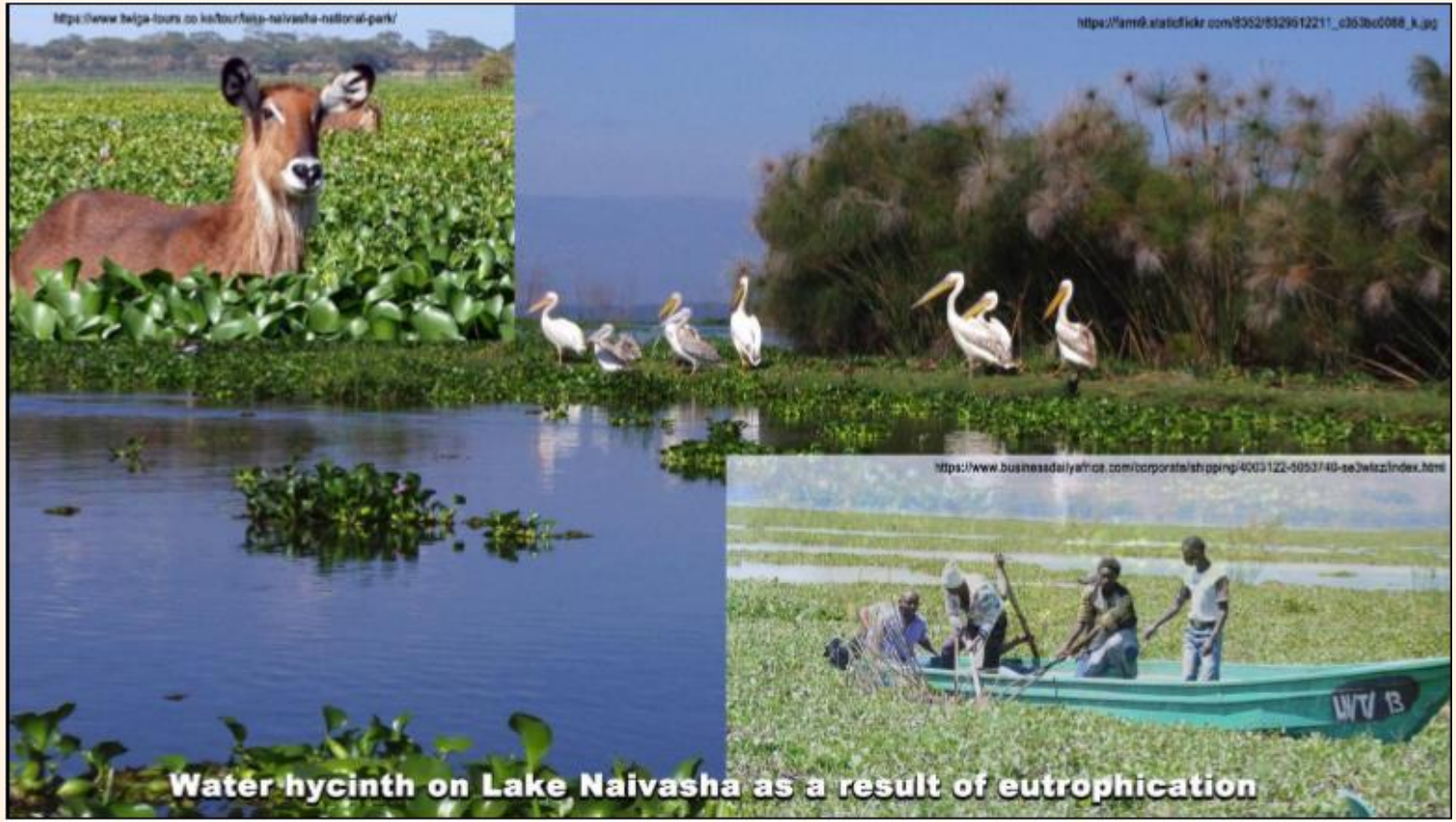
Cut flower production in Kenya (Lake Naivasha Basin) being blamed for causing a drop in the lake level, polluting the lake and for possibly affecting the lake's biodiversity.

Due to these economic activities in the area, over the years, much of the riparian vegetation has been cleared to make way for horticultural production and human settlement. As a result, the population working in the plantations has also participated greatly in the deterioration of the water quality in the lake.



Kenya's Lake Naivasha, surrounded with countless greenhouses producing cut flowers

Case Study in Kenya



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PART FIVE

OPPORTUNITIES & CHALLENGES IN PRECISION FARMING

- ✓ **Opportunities**
- ✓ **Challenges**

Opportunities & Challenges

- Available of too much data
- Advancement of artificial intelligence
- Less competitive : growing industry few operators
- Technology will play a big role in monitoring as well as providing hyper-local solutions

- Lack of experience and knowledge
- Internet of Things cybersecurity issues
- High Implementation costs
- Software systems sometimes deliver a narrow value that doesn't allow better decision making

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Thank You

THANK YOU FOR WATCHING