



# Ministry of Agriculture and Rural Development

## SMART AGRICULTURE FOR SUSTAINABLE CROP PRODUCTION IN VIETNAM

### *STRATEGIES & APPROACHES*

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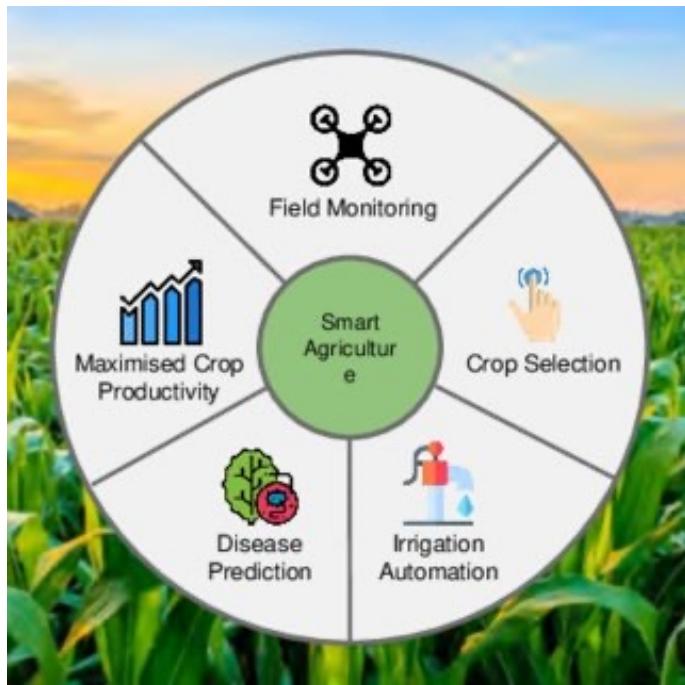
# Content

- Smart Agriculture and Climate Smart Agriculture
- Vietnam Agriculture
- Vietnam Climate Smart Agriculture – Strategies and approaches



# Smart Agriculture and Smart Farm

## Smart Agriculture

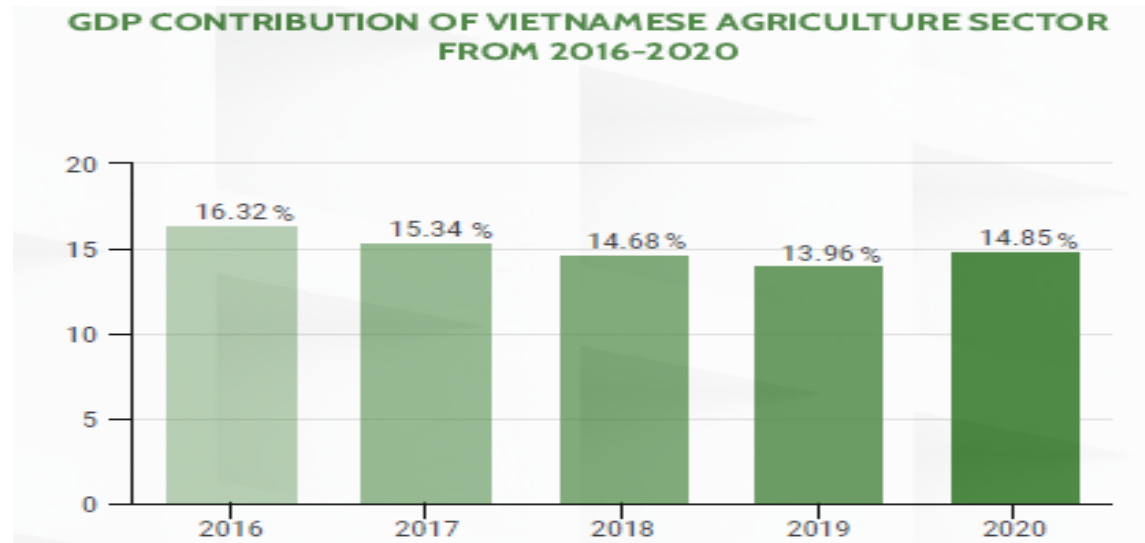
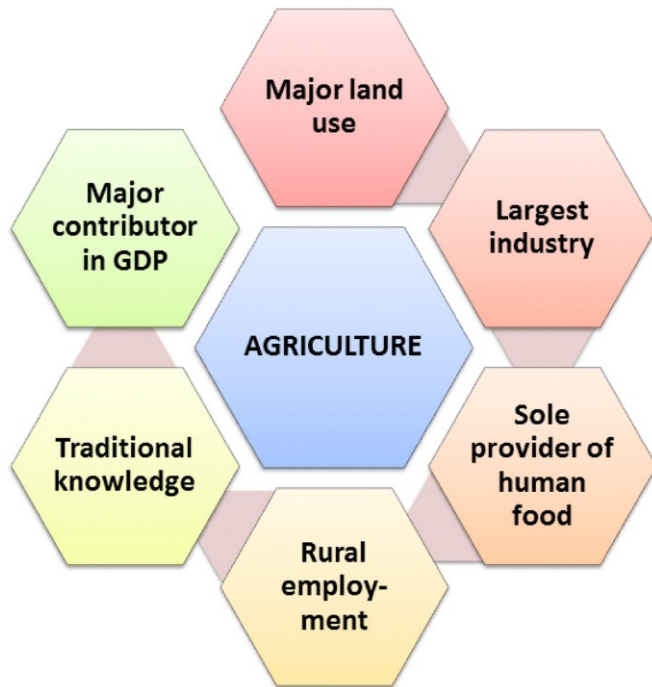


- Use of technology and digital techniques to reinvent, govern including economic-administrative processes to optimize agricultural production processes.
- Aimed to greater production and quality efficiency, the reduction of company costs, optimization of inputs and, minimization of environmental impacts
  - ➡ maximized crop production

## Smart Farm

Uses modern technology to increase the quantity and quality of agricultural products. It involves the incorporation of Information and Communication Technologies (ICT) into machinery equipment, and sensors for use in agricultural production systems

# Vietnam Agriculture



*Source: Business Centre - British Chamber of Commerce Vietnam*

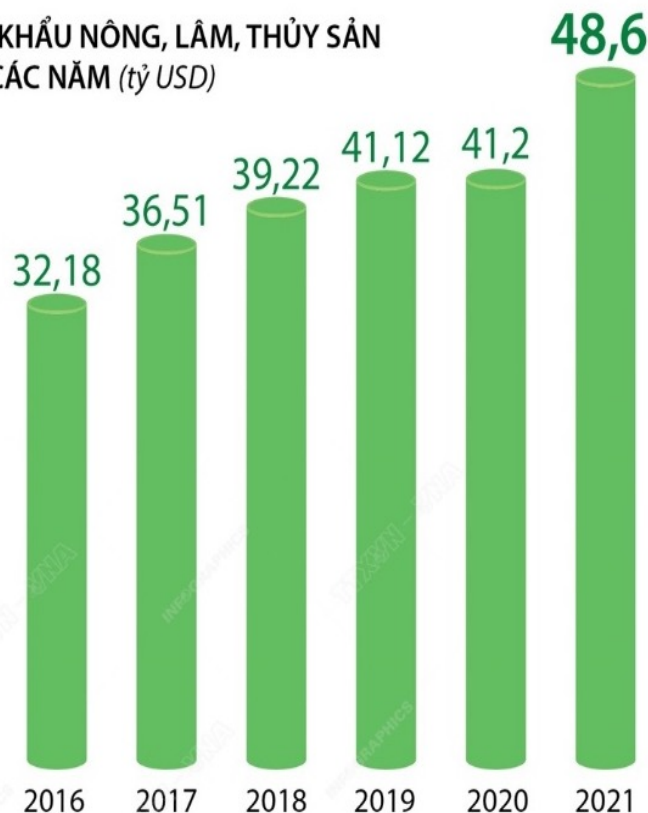
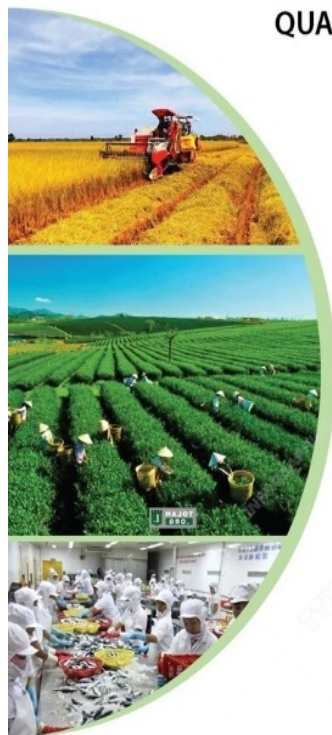


# Vietnam Agriculture

## Value of agricultural product export in 2021 (\$Billion USD)

Agri. export value (US \$ Billion)

XUẤT KHẨU NÔNG, LÂM, THỦY SẢN  
QUA CÁC NĂM (tỷ USD)



Agriculture

Nông sản chính



21,49

Forestry

Lâm sản chính



15,96

Aquaculture

Thủy sản



8,89

Livestock

Chăn nuôi



0,43 tỷ USD

US \$ Billion

6 NHÓM HÀNG XUẤT KHẨU TRÊN 3 TỶ USD NĂM 2021

Gỗ và  
sản phẩm gỗ



woods

Hạt điều



Cashew

Tôm



Shrimp

Gạo



Rice

Rau quả



Fruits &  
Vegetable

Cao su



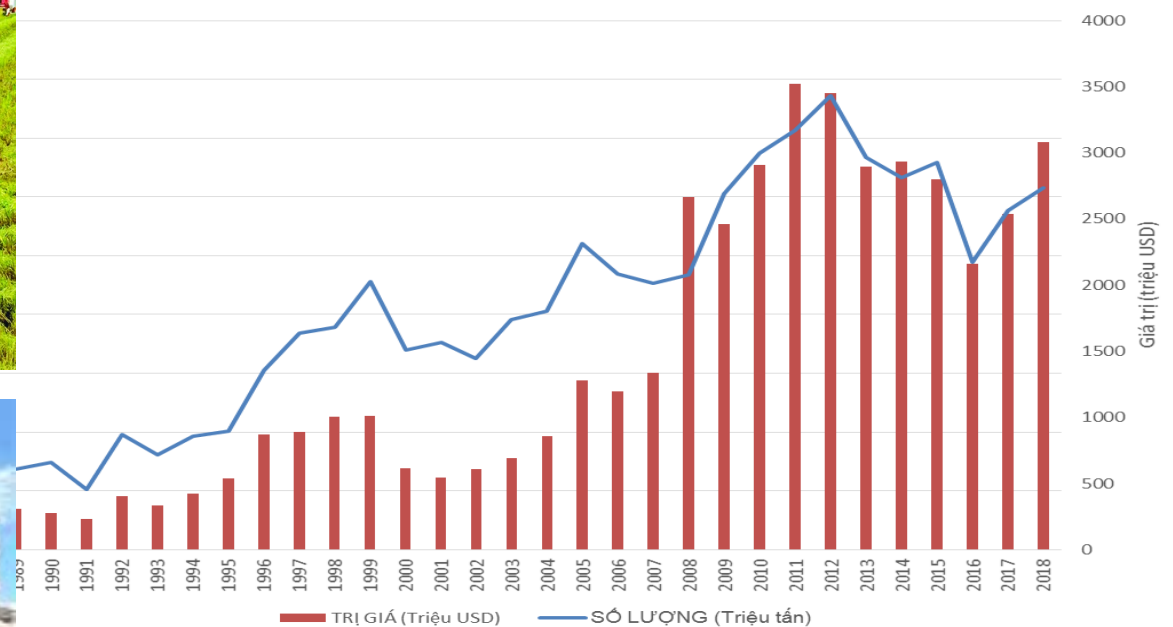
Rubber

# Vietnam Agriculture

- *Agricultural crops: rice, cassava, corn, sweet potato*
- *Industrial crops: Coffee, coconut, tea, pepper, cashew, sugar cane, peanut, soybean, tobacco, sesame*



*Vietnam rice export*



**Rice export value:**  
**2020: 3 Billion USD**  
**2021: 3.27 billion USD**

# Vietnam Agriculture

## Crop production

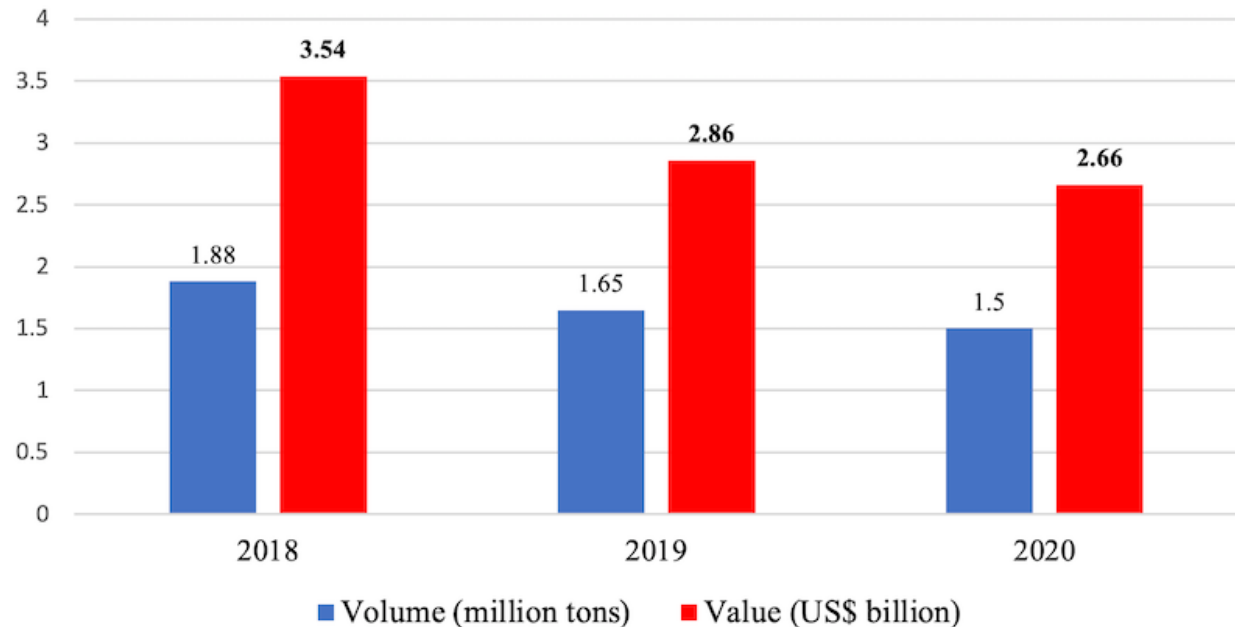
*Agricultural crops: rice, cassava, corn, sweet potato*

*Industrial crops: Coffee, coconut, tea, pepper, cashew, sugar cane, peanut, soybean, tobacco, sesame*



## Vietnam coffee export

Vietnam's coffee export volume and value, 2018-2020





# Vietnam Agriculture

## Crop production

*Agricultural crops: rice, cassava, corn, sweet potato*

*Industrial crops: Coffee, coconut, tea, pepper, cashew, sugar cane, peanut, soybean, tobacco, sesame*

## Quantity of some long duration crops in 2021

### SẢN LƯỢNG một số cây lâu năm năm 2021

938,2

nghìn tấn



▲ 4,9%

Xoài

386,6

nghìn tấn



▲ 22,6%

Vải

1,55

triệu tấn



▲ 33,2%

Cam

1,82

triệu tấn



▲ 3%

Cà phê

383,3

nghìn tấn



▲ 10%

Điều

280,3

nghìn tấn



▲ 3,7%

Hồ tiêu



# Vietnam Agriculture

## Climate change and climate change impact

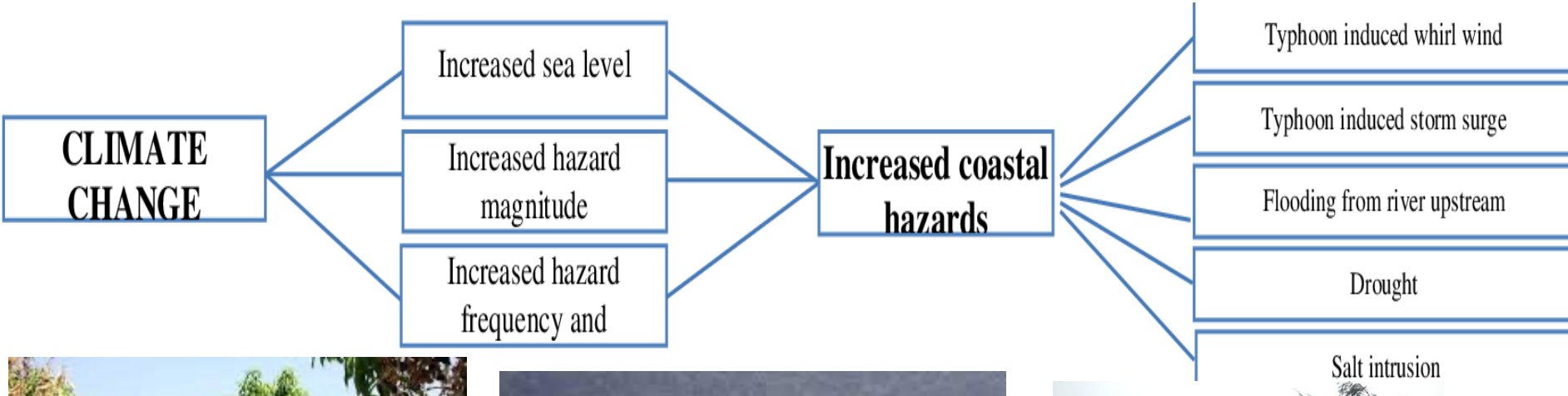
Climate change: A broad range of **global phenomena** include the increased **temperature** trends described by global warming, but also encompass changes such as **sea-level rise**; **ice mass loss** in Greenland, Antarctica, the Arctic and mountain glaciers worldwide; shifts in flower/plant blooming; and **extreme weather events**. It's may be natural or caused by human activities



# Vietnam Agriculture

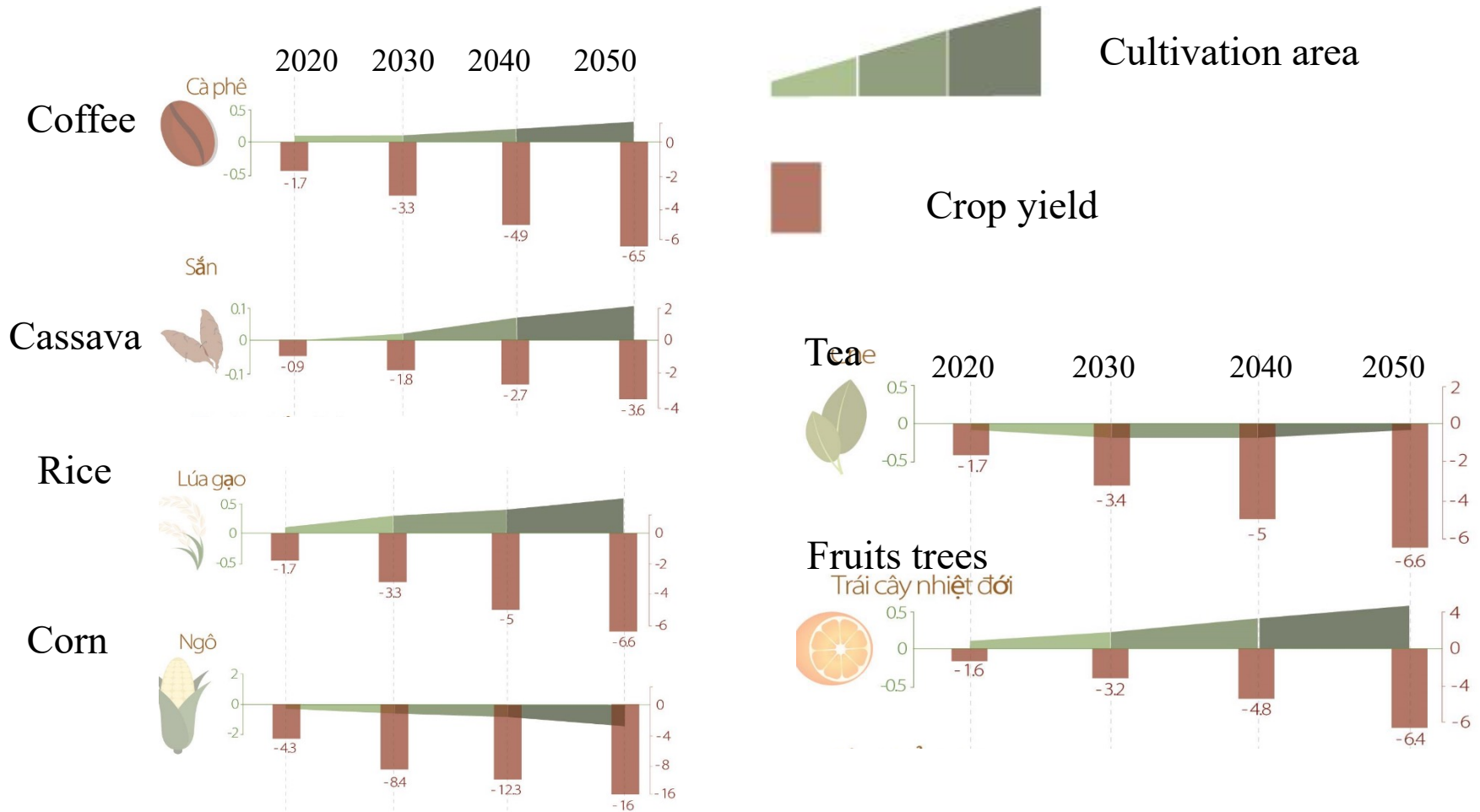
## Climate change impact on crop production of Vietnam

- Annual temperature will increase by 1.3oC- 1.7oC, and by 2100 will increase by 1.7°C- 2.4°C
- By 2100, the average annual rainfall will increase by 5% - 15%, but the dry season rainfall in some regions tends to decrease
- By 2100, the sea level will rise by 33 -83 cm compared to the period 1986 - 2005



# Vietnam Agriculture

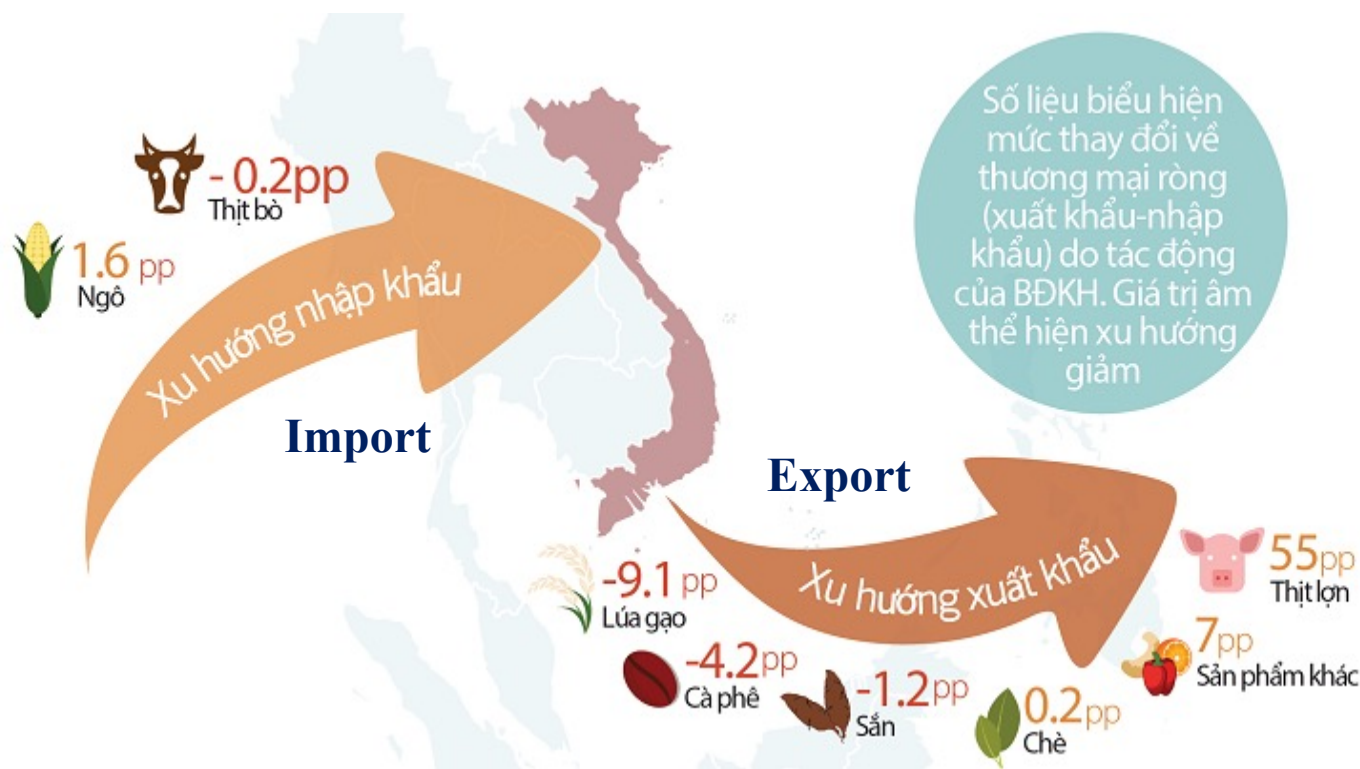
## Climate change impact on crop production of Vietnam



*Reduction of agricultural output by about 2-15%, in which rice production reduce about 2.7 million tons/year by 2050*

# Vietnam Agriculture

## Climate change impact on agricultural import-export of Vietnam



**Traditional Agriculture ➔ Climate Agriculture**



# Vietnam policies on climate agriculture

## Policy on the sustainable development

- ❑ **Resolution of Politburo and Central Committee of the Party on *Tam Nong (Agriculture, Rural and Farmers)*; *Direction of socio-economic development, ensuring national defense and security in the regions: Mountains Northern Midlands, Mekong Delta region...*** : The common goal: to protect the ecological environment; agricultural development suitable to the regional conditions and effective use of local natural resources;
- ❑ **Decision of the Prime Minister:**
  - ***The Strategy for sustainable development*** with the specific goal of minimizing adverse impacts on the environment; efficient and sustainable use of natural resources; prevent, manage and restore environmental damage, increase environmental quality; protection and management of forest resources, biodiversity; reduction impacts of natural disasters and quick, effectively adaptation to climate change;
  - ***National program on building new Rural (countryside)***, towards the green, clean and beautiful countryside; improve economic structure, production organization suitable to each locality in order to ensure ecological environment protection and economic - social development;
  - ***Green Growth Strategy*** towards the low-carbon economy through “greening” all areas of production, including agriculture through the increased efficient and sustainable use of natural resources, reduce greenhouse gas emissions and increase added value.
  - ***National action plan on green growth*** includes Building the policy and plan for green growth; Reduce GHG emissions and promote use clean energy, renewable energy; Greening production; Perform greening lifestyle and sustainable consumption.

# Vietnam policies on climate agriculture

## Policy on the climate change adaptation and mitigation

- ❑ **Resolution of Central Committee of the Party** on actively respond to climate change, strengthen the resource management and environmental protection”. The goal is the master adapting to climate change, preventing natural disasters, reducing gas emissions Greenhouse; fundamental changes in the exploitation and use of resources according to reasonable, effective and sustainable direction, curbing the increase in environmental pollution, towards a green economy.
- ❑ **Decision of the Prime Minister:**
  - ***National Strategy for Disaster Prevention and Mitigation*** with the goal to mobilize all resources for effective implementation of prevention, control and mitigation natural disasters in order to minimize the loss, limiting the destruction of natural resources, the environment and cultural heritage, contribute to ensuring the country's sustainable development
  - ***The national strategy to respond to climate change*** is aimed at both adaptation and mitigation; All ministries, localities and people must cooperate and work together to achieve the long-term goal of food safety and protect the natural resources
  - ***Project on management of gas emissions causing the greenhouse effect***
  - ***Target Program on Agricultural Restructuring, Prevention and mitigating natural disasters, stabilizing people's lives ....***

# Vietnam policies on climate agriculture

## Policy on the sustainable development of agriculture

### ❑ Decision of the Prime Minister:

- Building the production areas associated with processing, supporting and promoting large-scale production and consumption of agricultural products according to contracts.
- Project on agricultural restructuring towards harmonization between economic development and environmental protection
- **Decision of the Ministry of Agriculture and Rural Development**
- Directive on guiding the consolidation and exchange of production plots in large fields and the application of techniques of integrated crop management (ICM)
- Program framework on climate change adaptation in the agricultural sector
- Directive guiding the integration of climate change into the formulation and implementation of strategies, master plans, plans, programs and projects for agricultural and rural development
- Projects on development of crop production, forestry, animal husbandry, fishery and processing industries
- Project on reducing greenhouse gas emissions in agriculture
- Action plan of green growth in the agricultural sector
- .....

# Vietnam approaches on climate agriculture

## Sustainable crop production intensification

## Sustainable soil management

- Minimal tillage, sustainable farming
- Anti-erosion
- • Soil cover
- • Organic substances in the soil
- • Forest management:





# Vietnam approaches on climate agriculture

## Sustainable crop production intensification

### Water management

- Water reservoirs
- Saved watering (SRI, AWD)
- Sustainable water and forest management
- Weather forecast

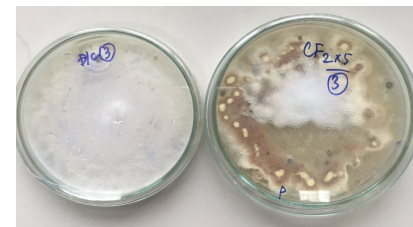
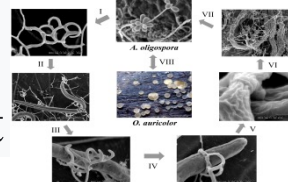


# Vietnam approaches on climate agriculture

## Sustainable crop production intensification

### Crop management

- Crop rotation
- Crop diversity
- Intercropping
- Crop Varieties  
(pathogen resistant,  
adverse conditions tolerant,  
short-term varieties by using  
traditional, genetic engineering  
and new breeding methods)
- Integrated weed/pest management

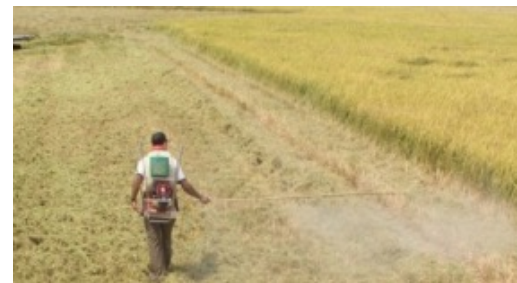




# Vietnam approaches on climate agriculture

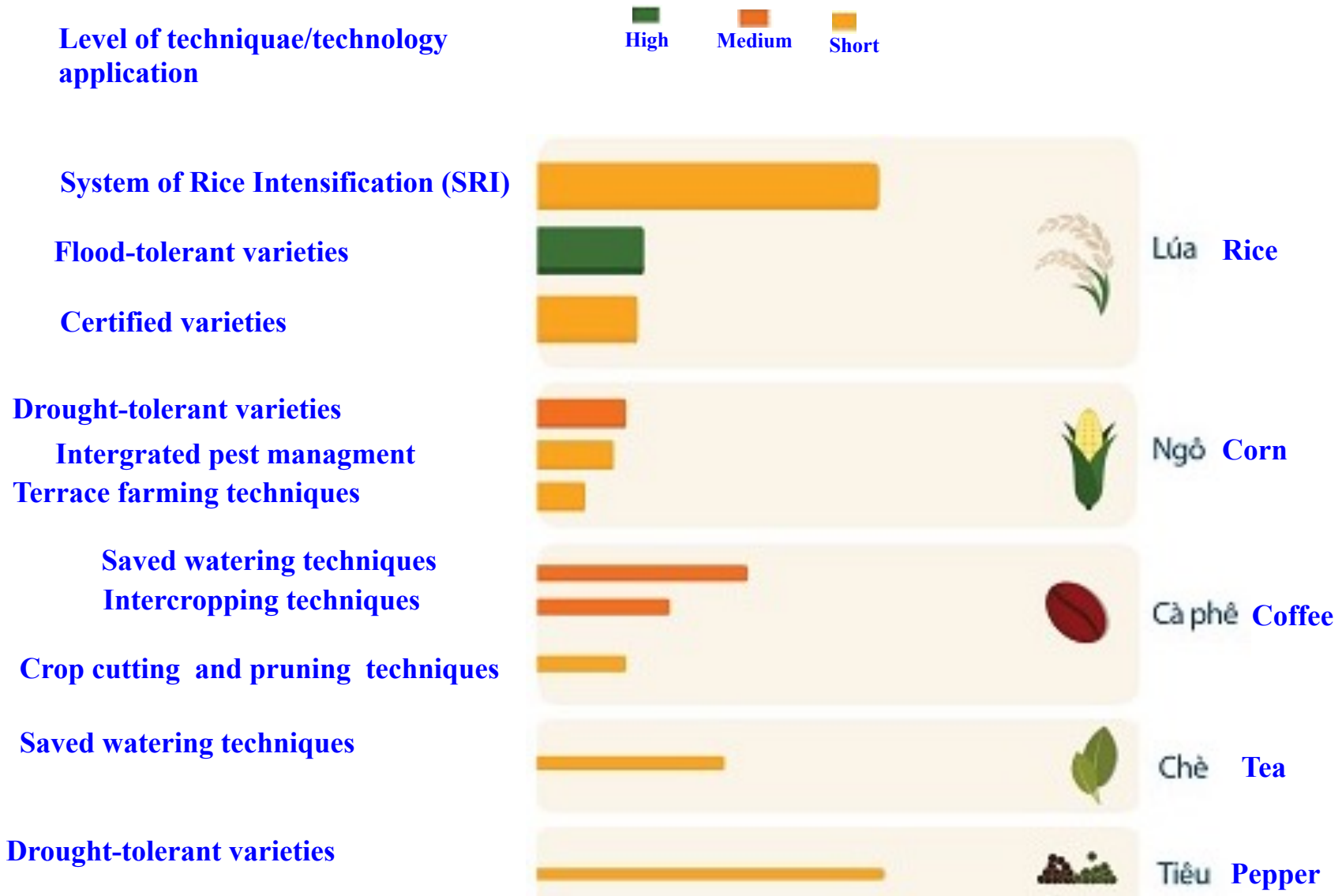
## GHG emissions reduction in crop production

- Reduction of GHG emissions in rice production by
  - Transforming the crop systems,
  - Applying new cultivation technology, techniques and
  - Using new plant varieties
- Reduction of GHG emissions in soil management & fertilizer use through the proper use of nitrogen fertilizers:
  - N-fertilizer form (NPK, coated urea, slow release nitrogen fertilizer...)
  - Apply methods and dose,
  - N-loss inhibition
- Reuse waste and by-products in crop production into bio-organic fertilizer, biochar, biogas



# Vietnam approaches on climate agriculture

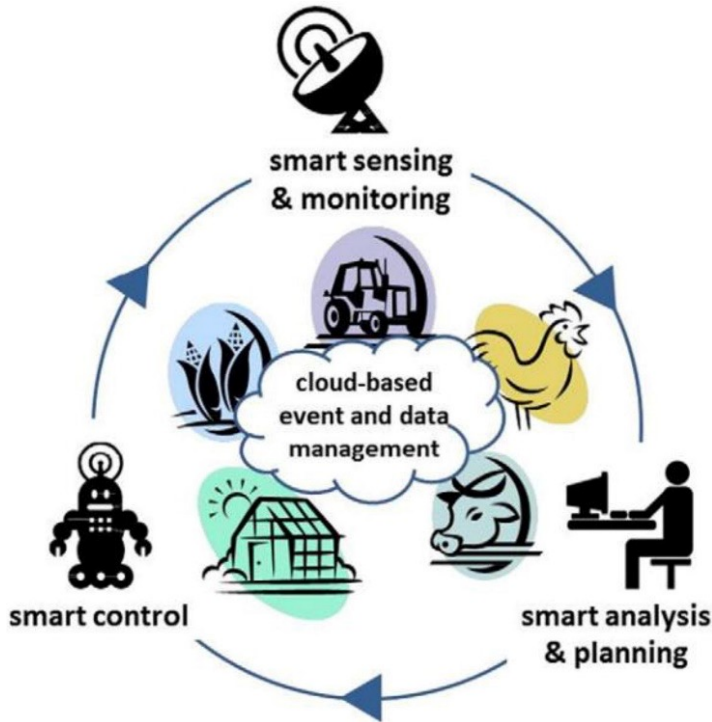
## Level of technique/technology application in the crop production





# Vietnam approaches on smart agriculture

## Smart farm



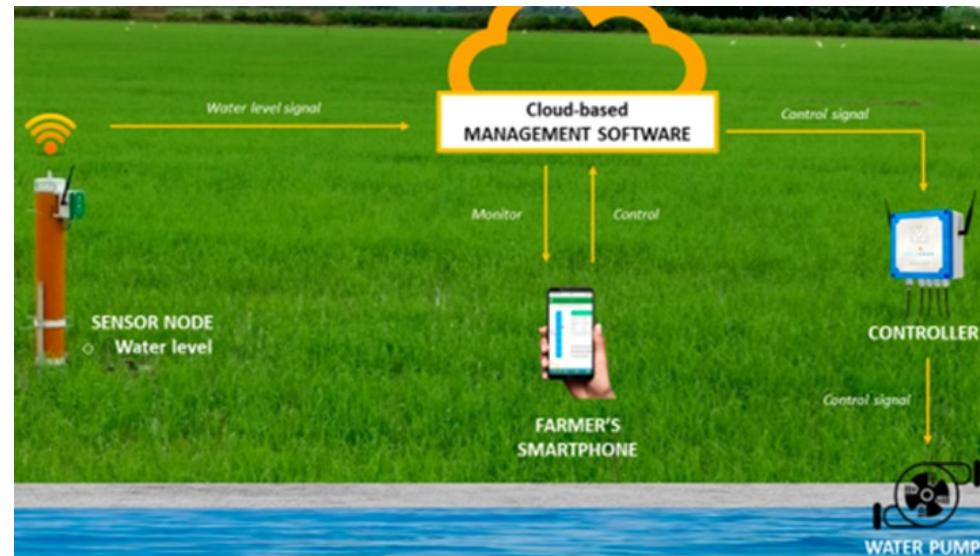
- ❖ Smart Farm: Integration of information and communication technologies into farm equipment and sensors for use in crop cultivation and food production system.
- ❖ Smart Farm includes: Internet of things (IoT) and various electronic instruments (robots and artificial intelligence) with data transformation and signaling facilities worlds (smart homes, smart health care) used in agriculture .
- ❖ Smart Farm help farmers to make better decisions in the management of their farms by efficient utilization of available resources, producing suitable yield and more income

# Vietnam approaches on smart agriculture

## Smart farm

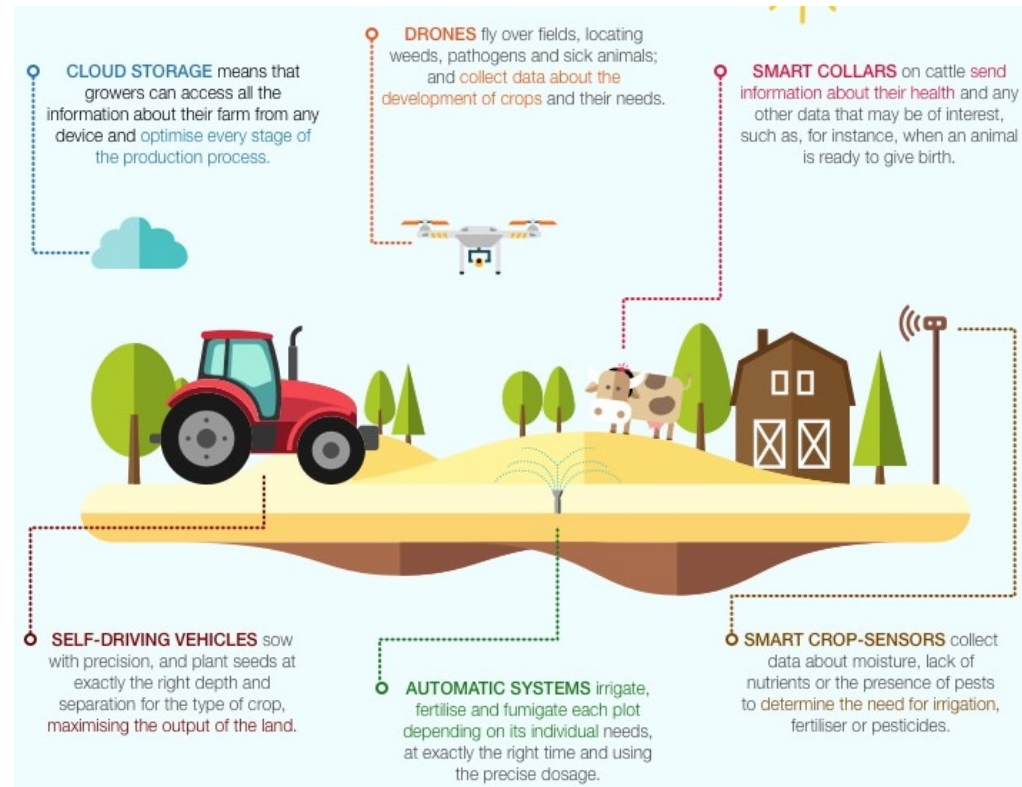
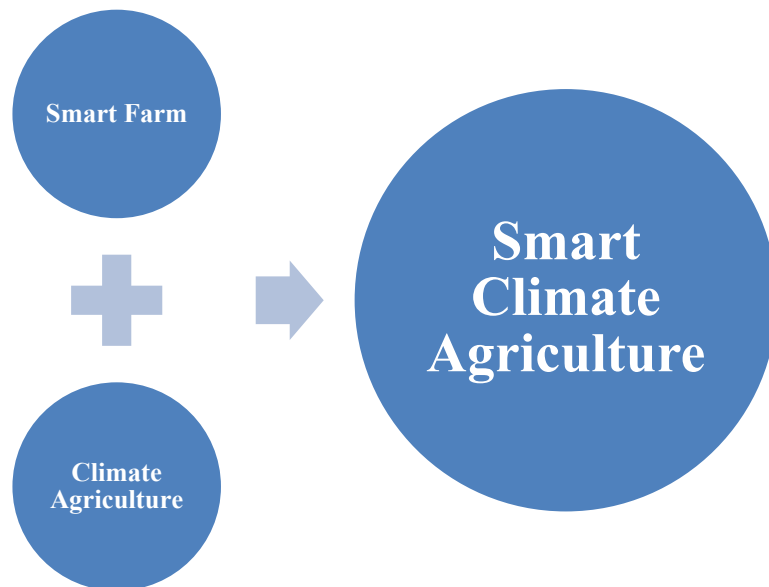
**Smart farm:** Replacing Labor with Automation (Robotics and Autonomous Systems-RAS):

- ☐ Soil preparation (Driverless Tractor);
- ☐ Seedbed Preparation and Seeding;
- ☐ Planting from the Air;
- ☐ Planting and Sowing
- ☐ Watering and Irrigation;
- ☐ Crop Health, Weeding, and Spraying;
- ☐ Drones for Fields
- ☐ Harvesting from Field



# Vietnam approaches on climate smart agriculture

## Vietnam Climate Smart Agriculture





THANK YOU FOR THE ATTENTION

