

Climate change security

Security solutions in the context of climate change in Vietnam and Japan

Dr. Nguyen Tai Tue

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Short Introduction



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VNU UNIVERSITY OF SCIENCE

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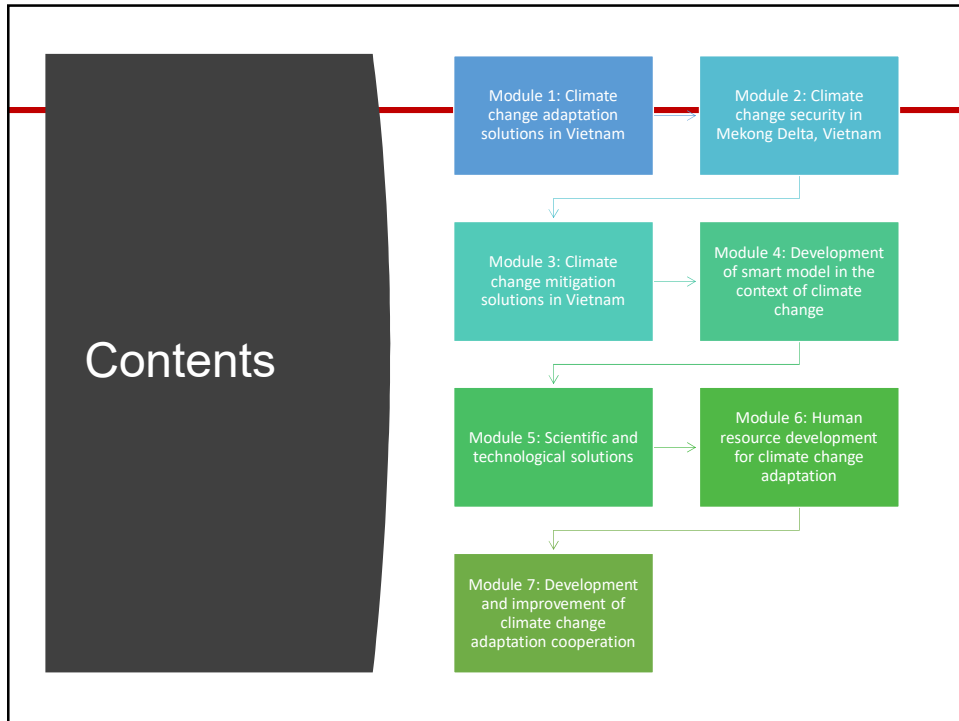
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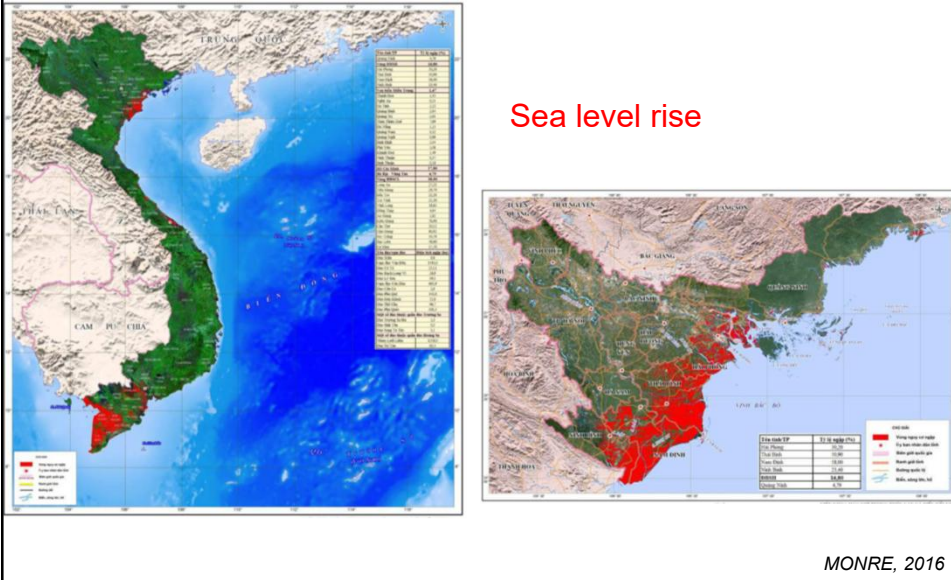


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Module 1 Climate change adaptation solutions in Vietnam

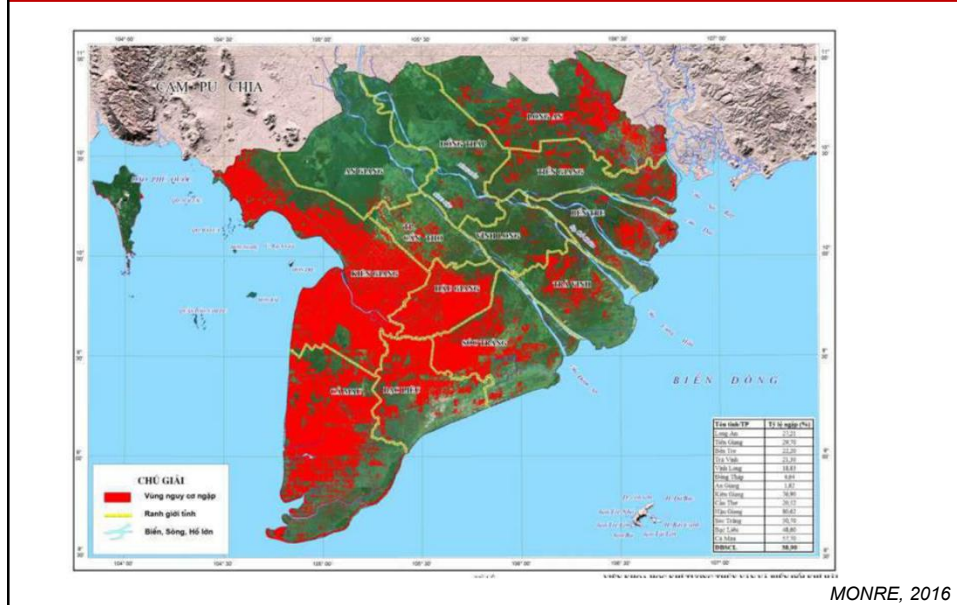
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Vietnam is one of the most vulnerable countries to climate change



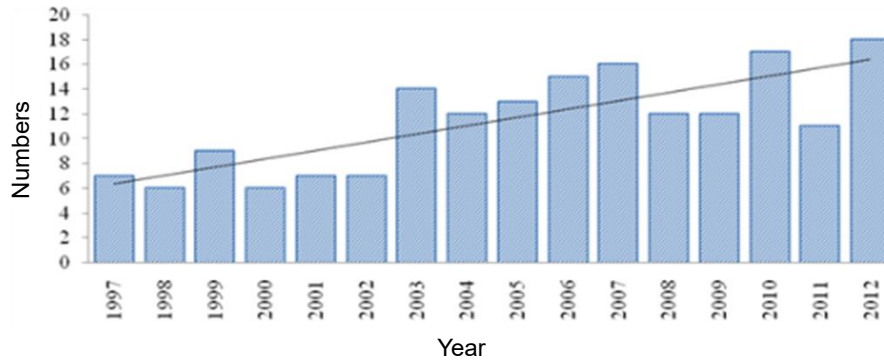
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Vietnam is one of the most vulnerable countries to climate change



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Vietnam is one of the most vulnerable countries to climate change



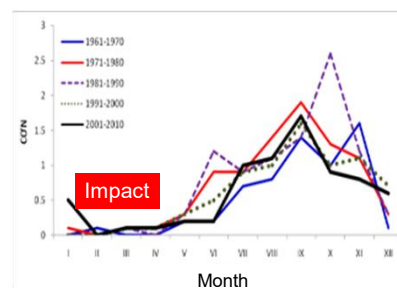
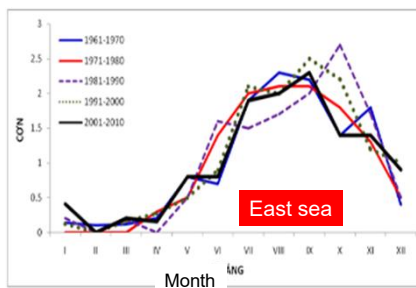
Heat waves

- Increased in number and magnitude, particularly, Central and Southern areas

MONRE, 2012

11

Vietnam is one of the most vulnerable countries to climate change



Typhoons

- Frequency: unclear trend
- Number of strong typhoons increases
- Typhoon season is later than usual and direction shifts to southern

MONRE, 2012

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Vietnam is one of the most vulnerable countries to climate change

4.33 m Affected people	395,000 People in need of humanitarian assistance	137,550 Houses damaged or destroyed
15 Provinces severely affected	US\$ 996.9 m Estimated total economic loss	



WB, 2017

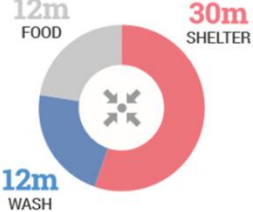
13

Vietnam is one of the most vulnerable countries to climate change


Funding

Sectors	Budget Required
Food Security and Livelihoods	US\$12.0m (\$8m for immediate humanitarian assistance, \$4m for early recovery)
Shelter	US\$30m (\$18.8m for immediate humanitarian assistance, \$10.2m for early recovery)
WASH	US\$12.0m (\$4.8m for immediate humanitarian assistance, \$7.2m for early recovery)
Total	US\$54m

US\$54m FUNDING REQUIRED



12m FOOD
30m SHELTER
12m WASH


Disaster induced climate change threatening National security

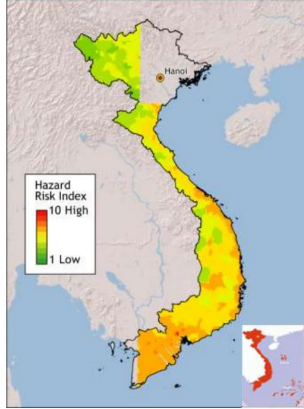
WASH: Water, Sanitation and Hygiene

WB, 2017

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Vietnam is one of the most vulnerable countries to climate change

Risk of Drought Mortality



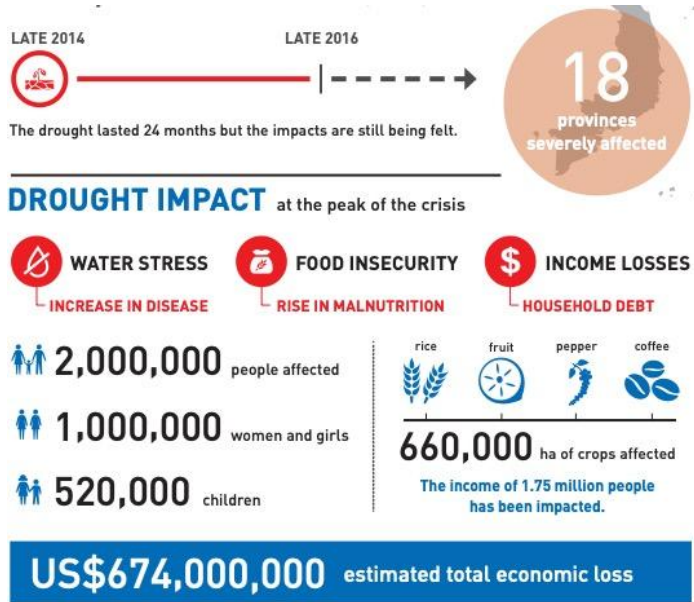
Drought

- Increased in number and magnitude, particularly, Central, highland and Southern areas
- River water level quickly decreases

(MONRE, 2012)

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Vietnam is one of the most vulnerable countries to climate change



WB, 2016

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Vietnam is one of the most vulnerable countries to climate change



Thạch Thảo - Theo Bloomberg

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Vietnam is one of the most vulnerable countries to climate change



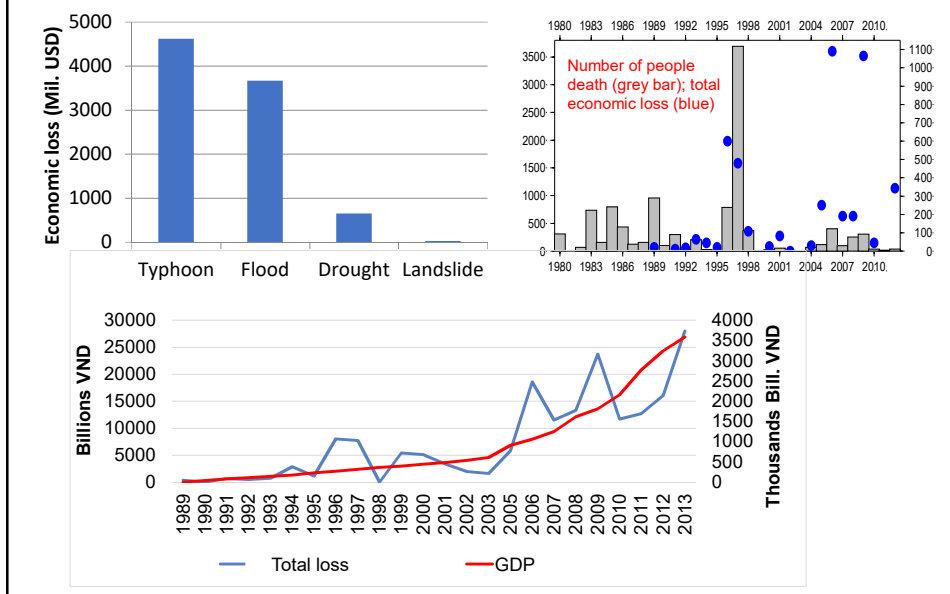
Floods

- Highly vulnerable areas: Red river delta, Mekong delta, Riverine estuaries of Central area

(Photo from internet)

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Economic loss by climate change



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Strategic viewpoints

- Viet Nam's response to climate change must be closely attached to sustainable development toward a low-carbon economy
- To simultaneously **adapt to climate change** and **reduce GHGs emission**, focusing on **adaptation in the early stage**
- Response to climate change is a responsibility of the whole apparatus; the State's decisive role in management must be highlighted, enterprises' creativity and responsibility encouraged, socio-political and professional organizations and communities' participation and supervision brought into full play; it is also necessary to make full use of internal forces and international cooperation
- Measures to cope with climate change must be **systematical, integrated, interdisciplinary, interregional, and suitable to specific stages and international stipulations**; they must be based on scientific foundations, traditional experience and indigenous knowledge; they must take into account socio-economic effects as well as risky and indefinite factors of climate change

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Climate change security options

- **Food security**
- **Water security**
- **Protecting and conserving forests**
- **Mitigating damages caused by natural disasters**
- **Greenhouse gas emission reduction**

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Climate change adaptation solutions for security

- **Food security**
 - What is the food security?
 - Can you propose the adaptation solutions for increasing **food security** in the context of climate change in Vietnam? Particularly, Mekong Delta are the most vulnerable area to climate change, but there is an important food producing for Vietnam
 - Discussion

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Climate change adaptation solutions for security

- Can you propose the adaptation solutions for increasing **food security** in the context of climate change in Vietnam? Particularly, **Mekong Delta** are the most vulnerable area to climate change, but there is an important food producing for Vietnam
- Discussion

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Quiz

- **Can you give some ideas to increase the climate security of Mekong Delta?**
 - Adaptation
 - Mitigation

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Food security

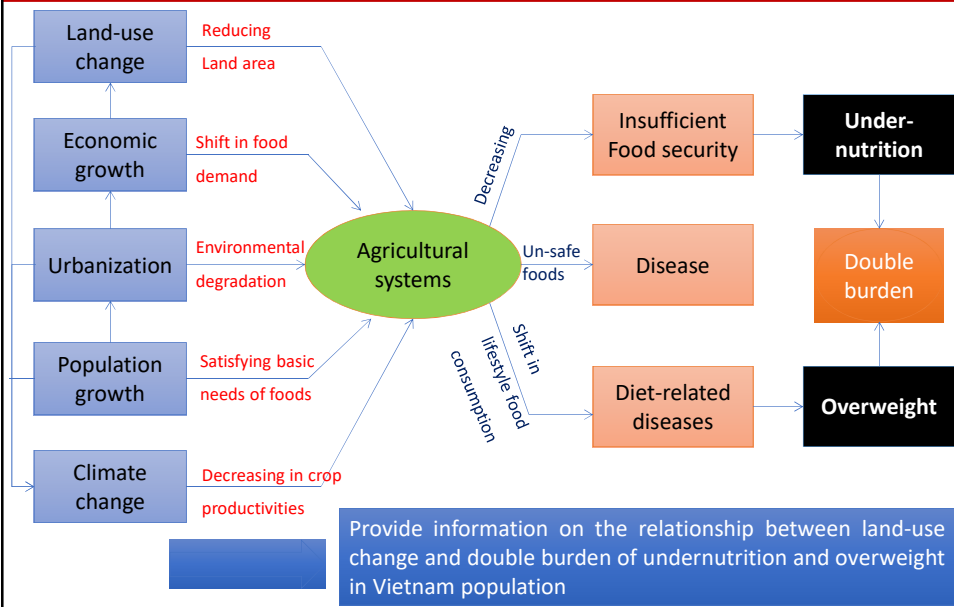
- Food security exists when all people, at all times, have physical and economic access to **sufficient, safe, nutritious and culturally appropriate food** to meet their dietary needs and food preferences for an active and healthy life (World Food Summit 1996).

The suite of food security indicators	
FOOD SECURITY INDICATORS	DIMENSION
Average dietary energy supply adequacy Average value of food production Share of dietary energy supply derived from cereals, roots and tubers Average protein supply Average supply of protein of animal origin	AVAILABILITY
Percentage of paved roads over total roads Road density Rail lines density	PHYSICAL ACCESS
Domestic food price index	ECONOMIC ACCESS
Access to improved water sources Access to improved sanitation facilities	UTILIZATION
Cereal import dependency ratio Percentage of arable land equipped for irrigation Value of food imports over total merchandise exports	VULNERABILITY
Political stability and absence of violence/terrorism Domestic food price volatility Per capita food production variability Per capita food supply variability	SHOCKS

FAO, 2013

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Factors affecting Food security



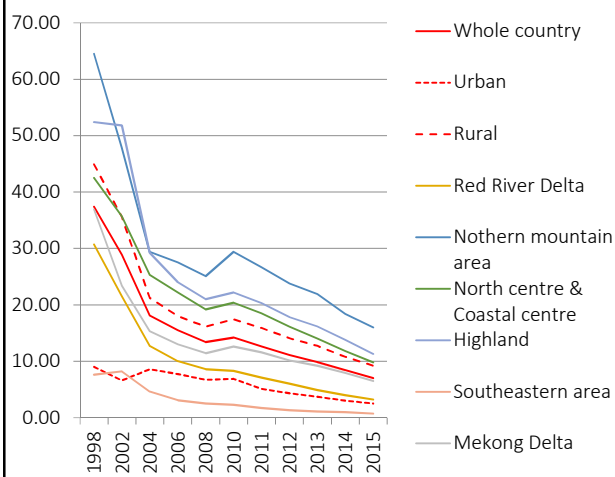
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Agricultural products of Vietnam



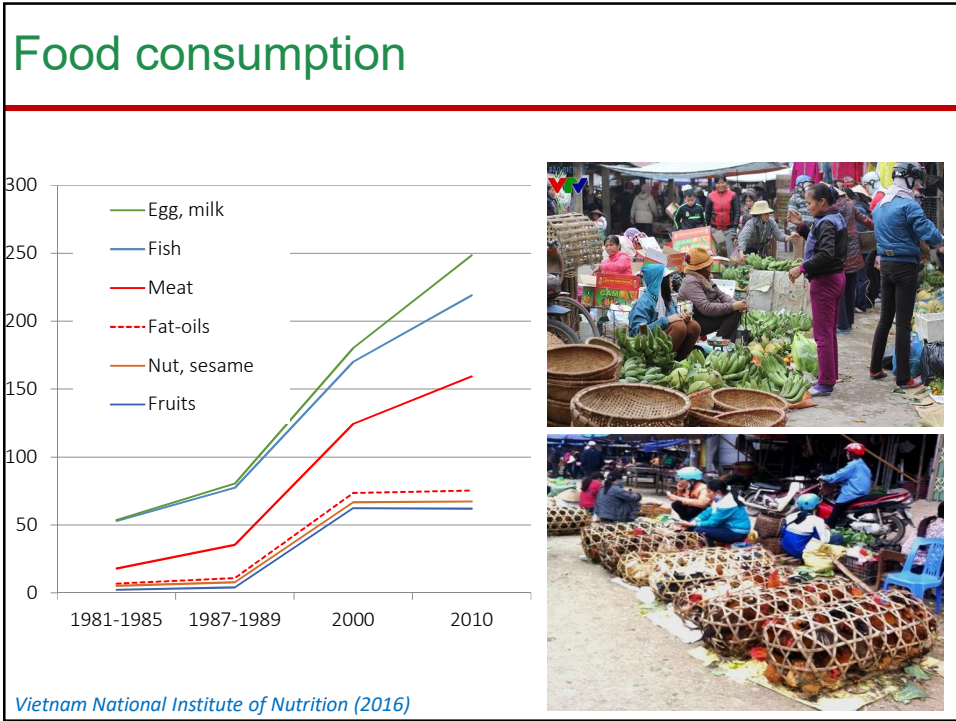
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Poverty rate (%)

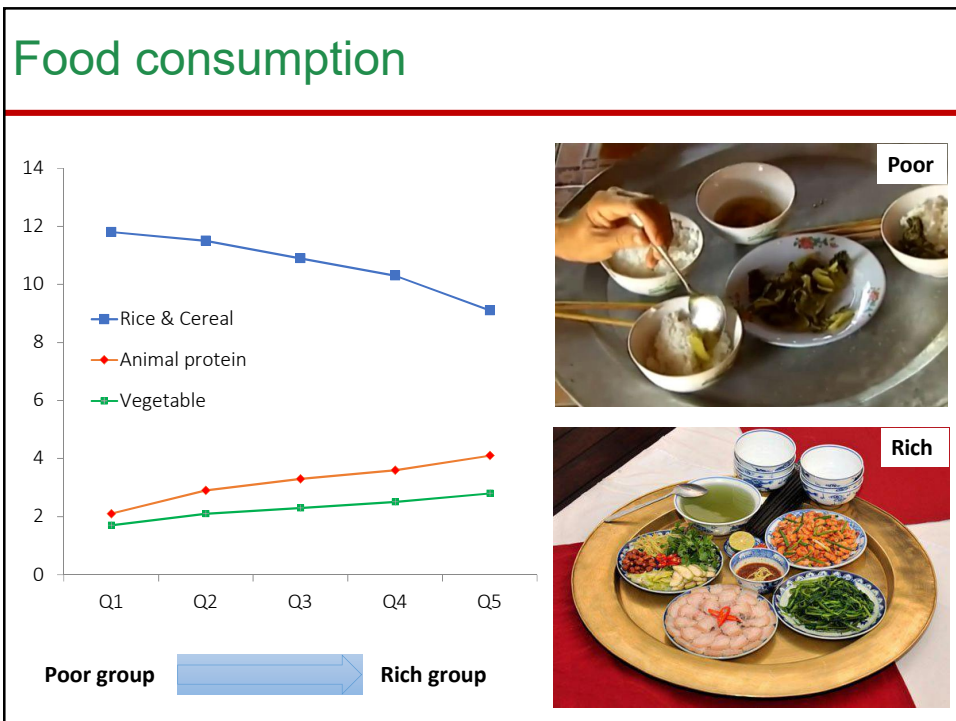


Vietnam GSO (2016)

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Poverty rate (%)



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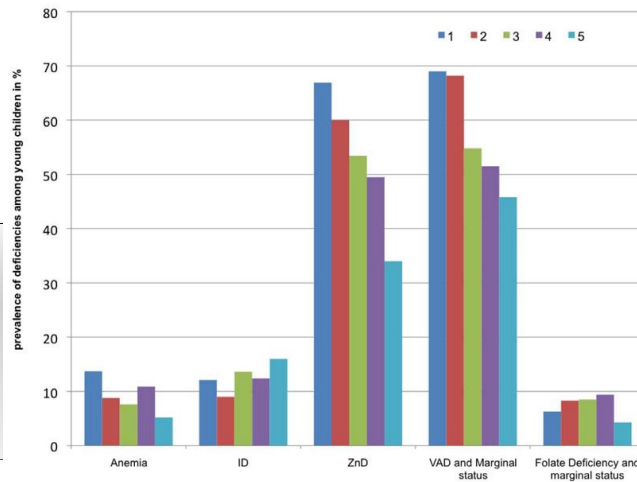
Poverty rate (%)



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Undernutrition & micro-nutrient deficiency

Socio-economic categories:
 1: the “extreme poor”;
 2: the “poor”,
 3 and 4: the “intermediate”
 5: the “wealthiest”

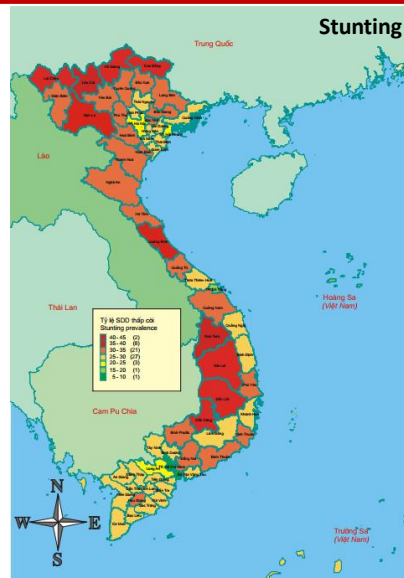


ZnD: zinc deficiency, VAD: vitamin A deficiency

Laillou et al. (2012)

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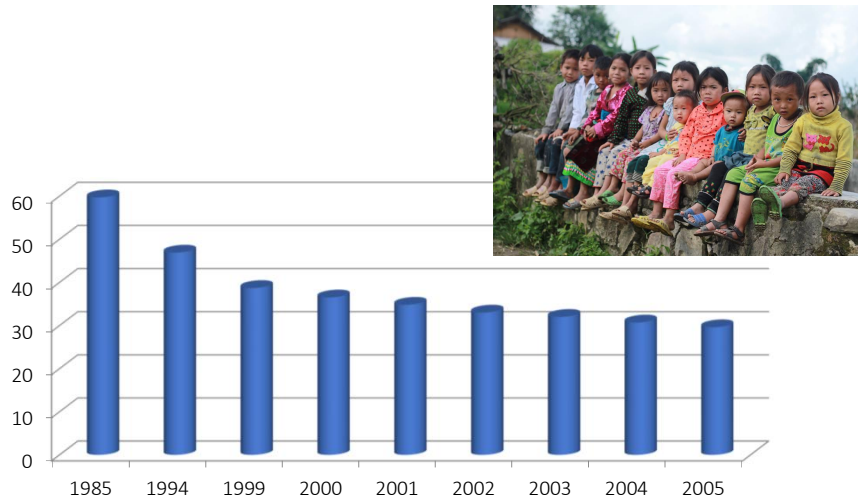
Undernutrition & micro-nutrient deficiency



Vietnam National Institute of Nutrition (2016)

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Temporal change in stunting in children






Vietnam National Institute of Nutrition (2016)

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Food security index

Our index measures the risks and factors that drive food security, including:

Affordability

- Food consumption as a share of household expenditure
- Proportion of population under global poverty line
- Gross domestic product per capita
- Agricultural import tariffs
- Presence of food safety net programs
- Access to farmer financing

Availability

- Sufficiency of supply
- Public expenditure on agricultural R&D
- Agricultural infrastructure
- Volatility of agricultural production
- Political instability

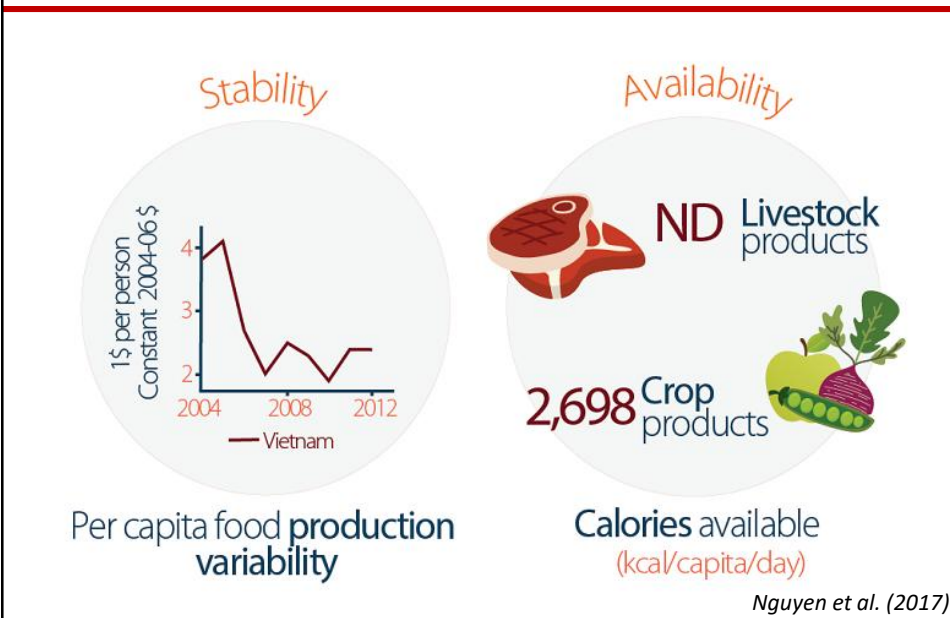
Quality and safety

- Diet diversification
- Nutritional standards
- Micronutrient availability
- Protein quality
- Food safety

<https://foodsecurityindex.eiu.com/>

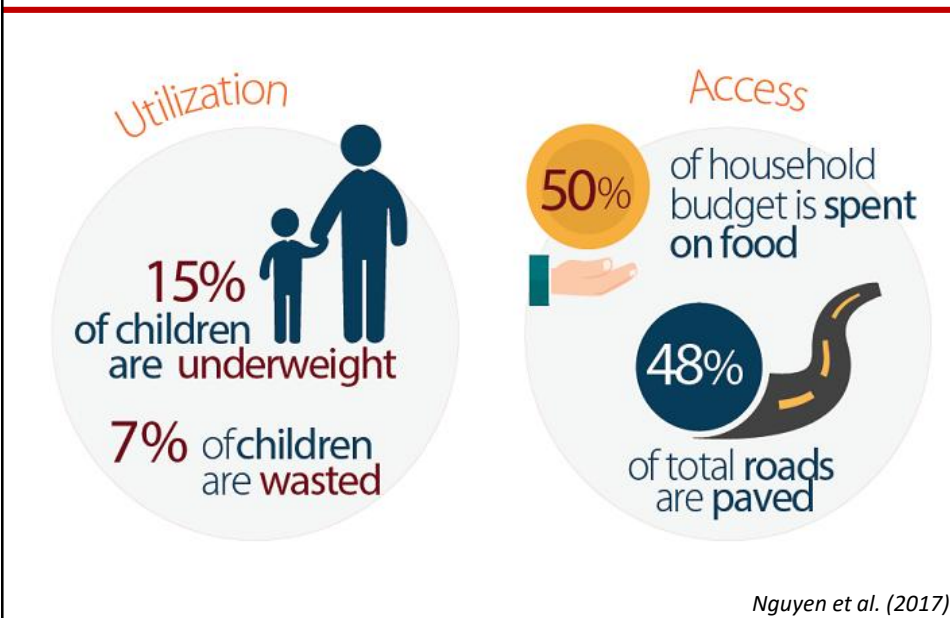
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Food security index of Vietnam

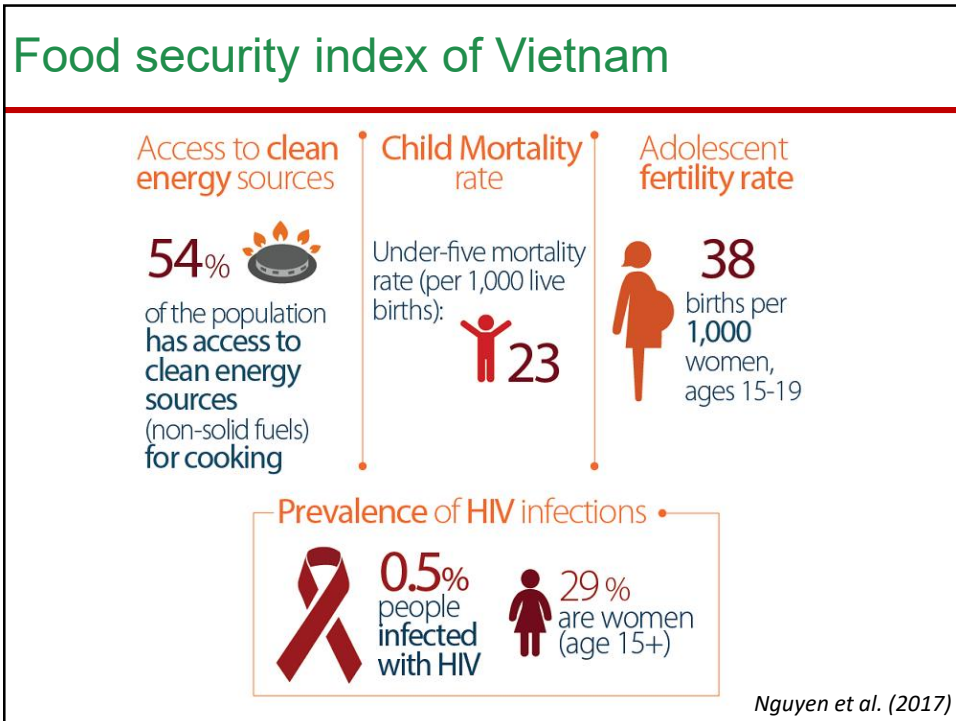


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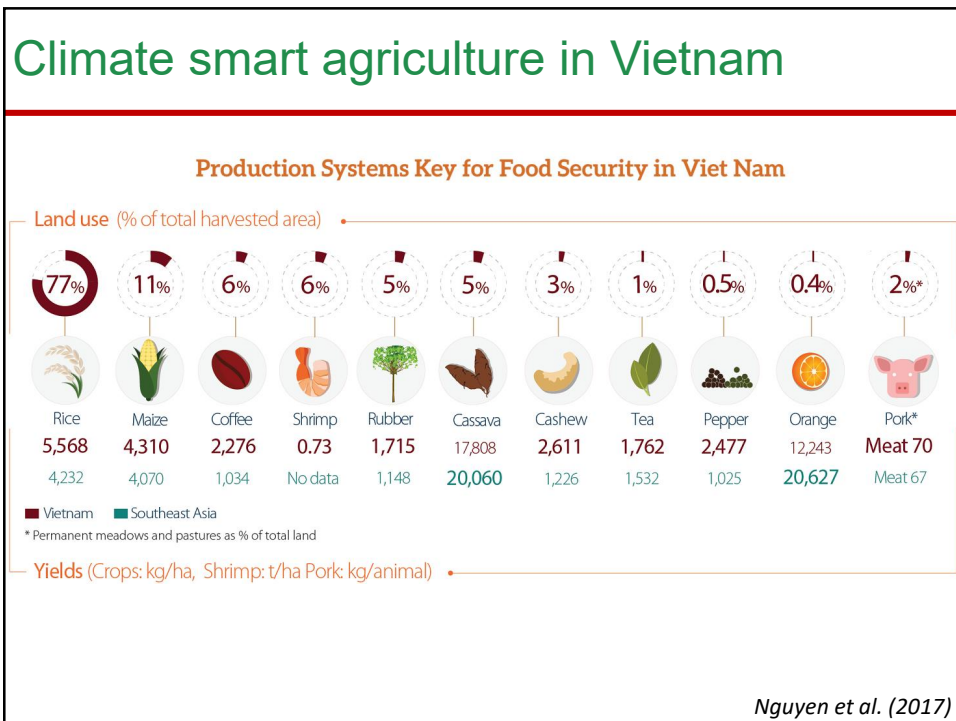
Food security index of Vietnam



38



39



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Food security index of Vietnam

Food security •

Score 0-100*

Global** 56

Vietnam 51

South East Asia 54

12 of 100 people
is undernourished

* Takes into account aspects of affordability, availability, and quality

** Refers to the 113 countries included in the Index

Nguyen et al. (2017)

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Climate change adaptation solutions for security

• Food security

- To maintain a proper and **sustainable lands** for agricultural activities in all localities in order to guarantee food security in the context of climate change;
- To survey and **change the cultivation and husbandry structure** in line with conditions of climate change and sea level rising as well as ecological characteristics of specific regions and localities, to make full use of all chances for sustainable agricultural development;

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Climate change adaptation solutions for security

• Food security

- To research, develop and introduce **biotechnologies**, apply advanced production processes for a modern agriculture which can adapt to climate change;
- To build and perfect a network of controlling and **preventing diseases** for crops and domestic animals under conditions of climate change;
- To design regimes and policies, to **strengthen insurance system for mitigating risks in agricultural activities**.

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Climate change adaptation solutions for security

• Food security



Smart agriculture



Smart aquaculture

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Climate change adaptation solutions for security

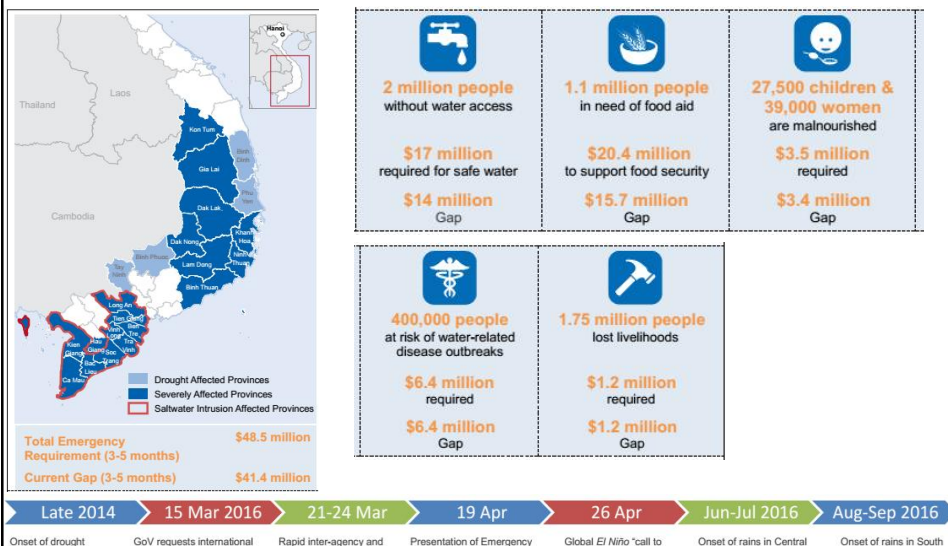
• Water security

- Do you think Vietnam is a water security country?
- Discussion
- Proposing the adaptation measures for increasing water security in the context of climate change in Vietnam?

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Climate change adaptation solutions for security

• Drought



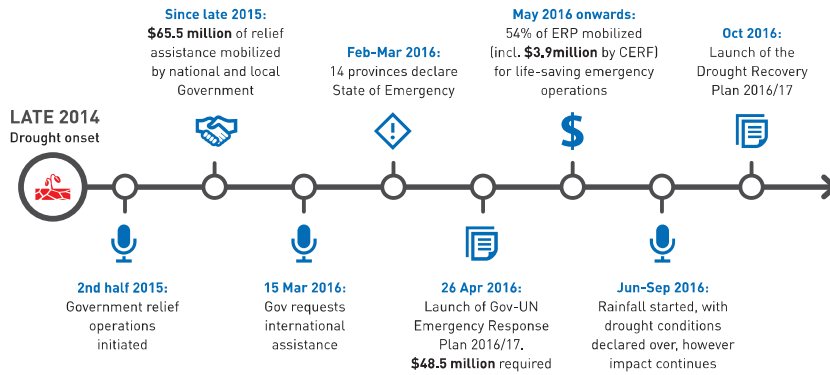
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Climate change adaptation solutions for security

• Drought recovery for Food security

RESPONSE AND RECOVERY TIMELINE

A fast, coordinated and multi-stakeholder humanitarian response



WB, 2016

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Climate change adaptation solutions for security

• Drought recovery for Food security



WB, 2016

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Climate change adaptation solutions for security

• Drought recovery for Food security

Recovery funding as estimated by Government:

2017: US\$368 million
2018-2020: US\$687 million

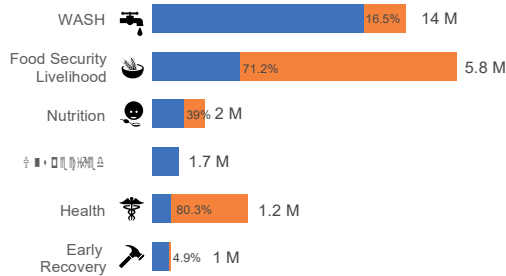
WB, 2016

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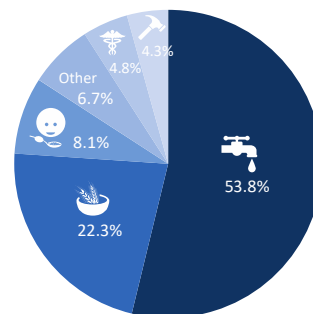
Climate change adaptation solutions for security

• Drought recovery for Food security

Funding per sector



Sectoral share

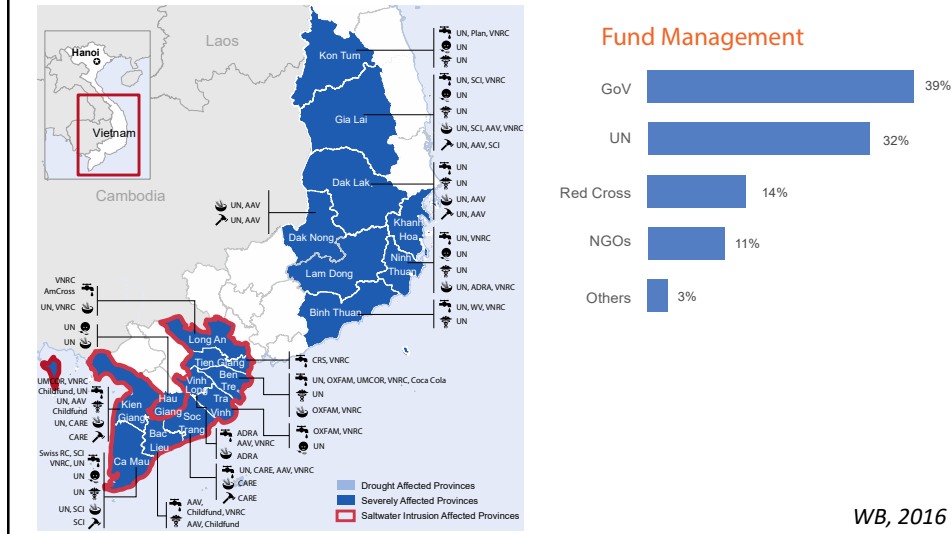


WB, 2016

50

Climate change adaptation solutions for security

• Drought recovery for Food security



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Climate change adaptation solutions for security

• Water security

- To build the database of change and use of water resource in relation with climate change;
- To enhance international cooperation in researching, evaluating, and managing quality and volume of water resource as well as sharing transborder water profits;
- To design the master planning scheme of water resource in river watershed Bằng Giang-Kỳ Cùng, Red River, Mã-Cả, Trung Trung Bộ, Nam Trung Bộ, Sesan-Srepok, Đồng Nai-Sài Gòn, and Mekong;
- To set up and perfect standards and regulations for effective and multi-purposed exploitation and use of water resource in conformity with climate change and sea level rising;

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Climate change adaptation solutions for security

- **Water security**

- To improve, upgrade, repair and build irrigation works, hydroelectric plants, and systems of river dike and breakwaters which can effectively cope with floods, droughts, sea level rising, and salt contamination in the context of climate change;
- To complete general management processes and projects for scientific exploitation, protection and use of water resource in the context of climate change by 2050;
- To improve the management of water resource; to promote the realization of planning schemes and take synchronous measures for sustainable development of the country's water resource in the context of climate change. This work must be in the main fulfilled by 2020 and further completed in the following stages.

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Climate change adaptation solutions for security

- **Protecting and conserving forests**

- Please write down the adaptation measures for Protecting and conserving forests in the context of climate change in Vietnam?
- Discussion

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Climate change adaptation solutions for security

• Protecting and conserving forests

- To speed up the schedule of afforestation and re-afforestation projects, encourage enterprises to invest in planting economic forests. Up to 2020, it is necessary to establish, manage, protect, develop and use 16.24 million hectares of land planned for forestry activities in a sustainable way; raise the forest coverage to 45%; sustainably and effectively manage 8.132 million ha of production forests, 5.842 million ha of preventive forests and 2.271 million ha of special-use forests;
- To preserve biodiversity, protect and develop ecosystems and species which can well resist climatic changes; to protect and preserve genes and species endangered by impacts of climate change;
- To craft and realize programs on reducing greenhouse gas emission through efforts of minimizing forest loss and deterioration, managing forest in a sustainable way, preserving and improving forests' absorption of carbon, and maintaining and diversifying local people's livelihood as well as helping them to adapt to climate change;

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Climate change adaptation solutions for security

• Protecting and conserving forests

- To design and implement programs on protecting and managing available natural forests, preventive forests, special-use forests, and production forests;
- To design and implement models of green urban and residential areas;
- To craft and realize policies on engaging socio-economic sectors in sustainably protecting and developing forests and natural ecosystems in order to cope with climate change while improving the carbon absorption of these forests and ecosystems;
- To increase capacity and efficiency of systems for evaluating, forecasting, preventing, monitoring, supervising and urgently responding to forest fires.

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Climate change adaptation solutions for security

• Mitigating damages caused by natural disasters

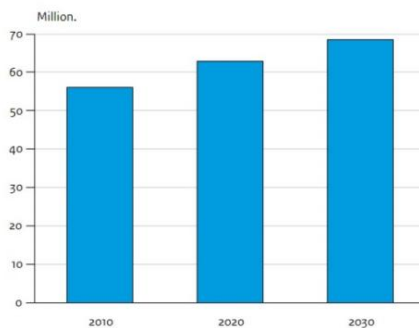
- Please write down the adaptation measures for Mitigating damages caused by natural disasters, for example, flood and typhoon in the context of climate change in Vietnam?
- Discussion

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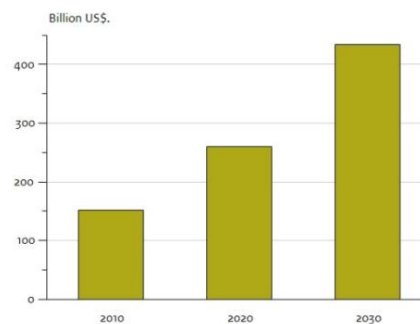
Climate change adaptation solutions for security

• Flood

Population in Vietnam at risk by floods



Value in Vietnam at risk by floods



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Module 2
Climate change security in Mekong
Delta, Vietnam

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Climate change adaptation solutions for security

- Can you propose the adaptation solutions for increasing **food security** in the context of climate change in Vietnam? Particularly, **Mekong Delta** are the most vulnerable area to climate change, but there is an important food producing for Vietnam
- Discussion

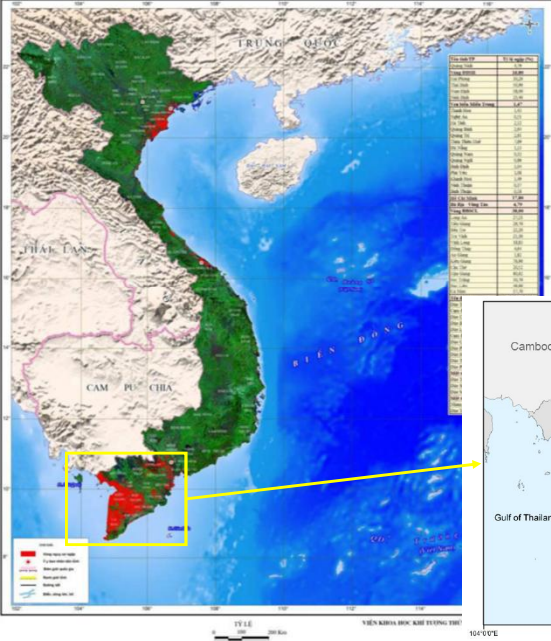
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Module 2

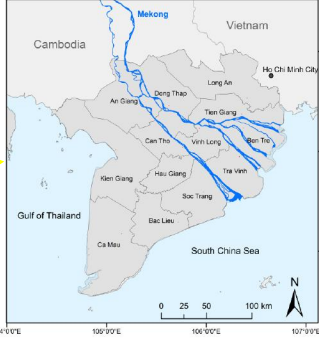
Climate change security in Mekong Delta, Vietnam

1

Introduction



Deltas and megadeltas: hotspots for vulnerability (IPCC, Climate Change 2007)



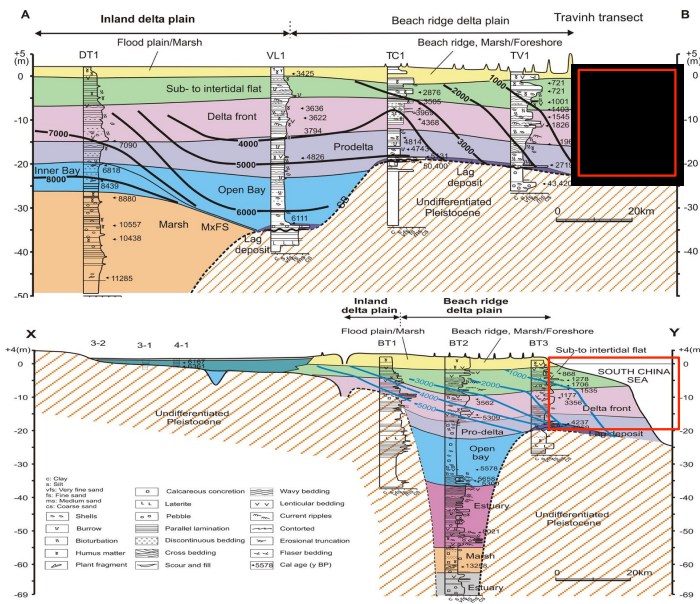
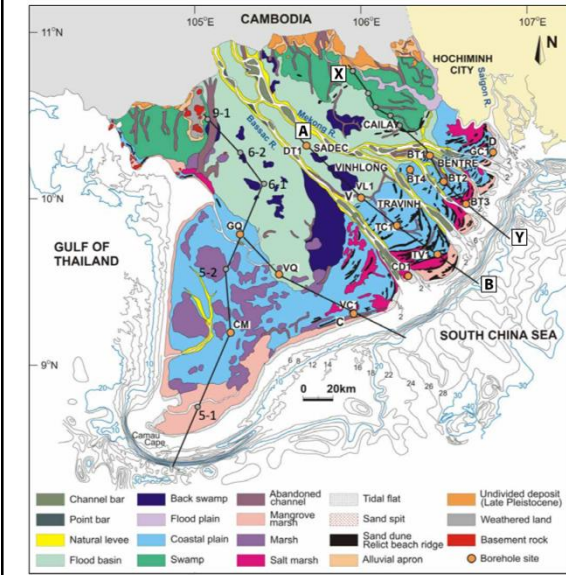
- 13 provinces and cities,
- Population: 17.66 million (19% VN)
- Population density: 433 people/km².
- Rice export: 90% total VN
- Aquaculture: 60% total VN

(GSO, 2016)

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Factor affecting sustainable development and climate change response

Evolution of geology and geomorphology

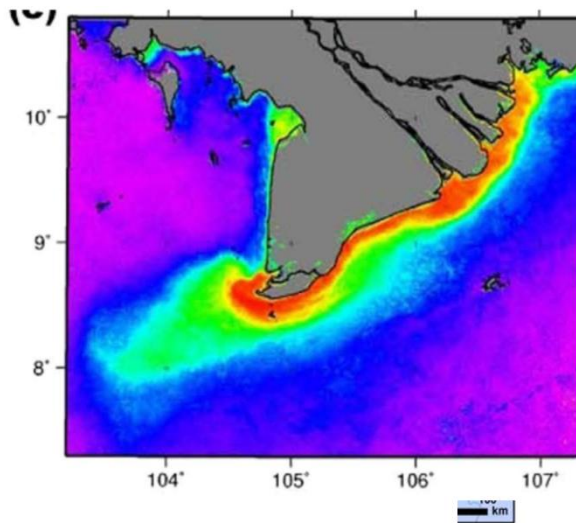


J. Paul Liu et al., 2017

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Factor affecting sustainable development and climate change response

Evolution of geology and geomorphology



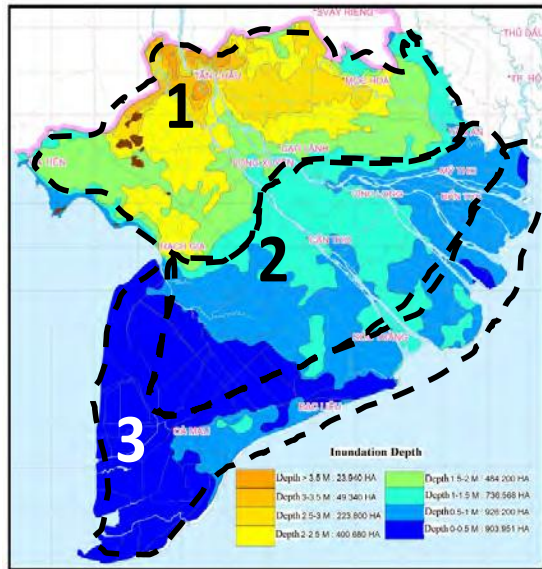
MERIS images covering the period 2003–2012

Edward J. Anthony et al., 2015

4

Factor affecting sustainable development and climate change response

Geomorphological characteristics



ICEM, 2012

- Low land, average elevation 3-5 m; slope 1 cm/km, little mountain;
- The lowest land: Dong Thap Muoi, Long Xuyen Quadrangle – Ha Tien, U Minh

Three submerging areas

- | | | |
|---|---|---|
| 1. Deep Submergence : 2-3 m, accounting for 800 thousand ha | 2. Average submergence: 0.5 - 2 m, accounting for 500 thousand ha | 3. Shallow submergence: 0.1 – 0.5 m, the rest of MK |
|---|---|---|

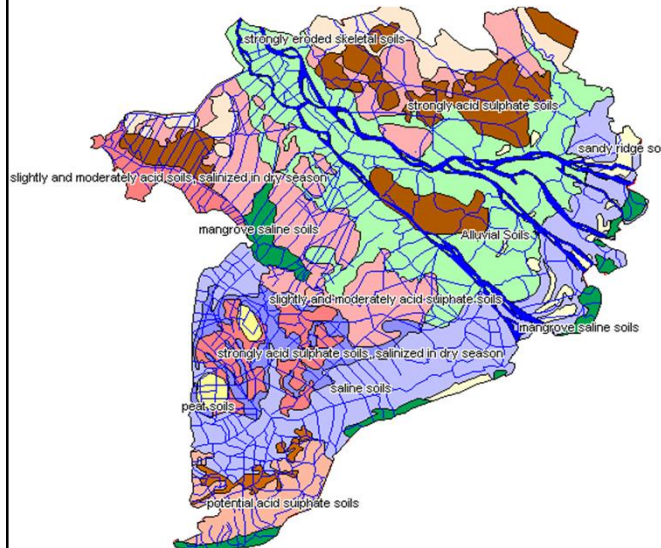
Vulnerable to typhoon, flood, climate change, SLR

5

Factor affecting sustainable development and climate change response

Natural resources

Land resources



Water resources

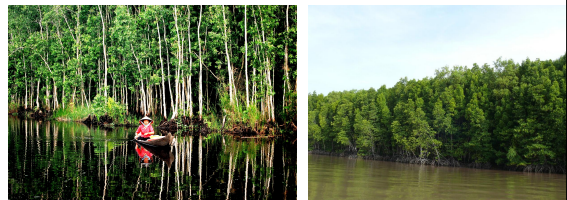
Surface water:

- 450 billions m³ from outside; 22 billions m³ within MK
- Dried season: accounts for only 10% total water
- Average water discharge into MK: 12,900 m³/s

Ground water:

- Groundwater layers, distributed in the depth from a few dozen meters to 500-600 meters
- Total natural reserve is approximately 21 million m³/day
- 2 million wells to exploit the groundwater (550,000 large drilled wells)

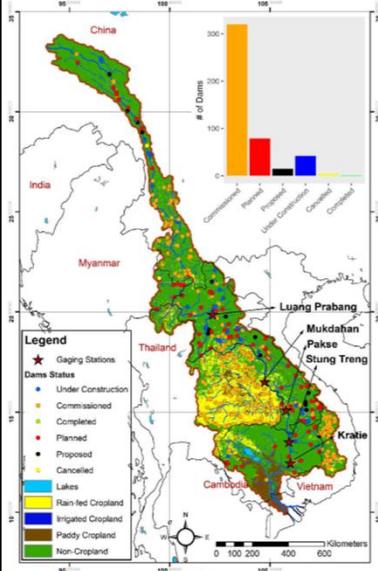
Biodiversity



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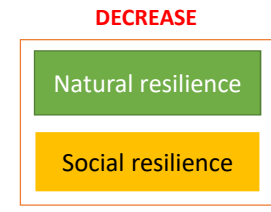
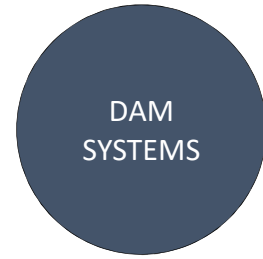
Factor affecting sustainable development and climate change response

Reduction of water discharge in river systems



Yadu Pokhrel et al., 2018

MK delta evolution: based on the suspended sediments transported by river systems
 Total suspended sediment at Karatie (Cambodia) ~ 145-166 millions tons/year
 + Suspended sediments fill up the delta and expand towards the sea



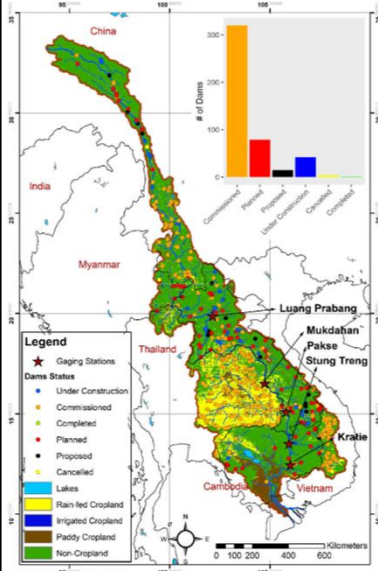
- Erosion
- Land subsidence
- Other hazards

- Accumulation of suspended sediments;
- Significantly decrease suspended sediment transported into MKD
- Significantly decrease expansion toward the sea

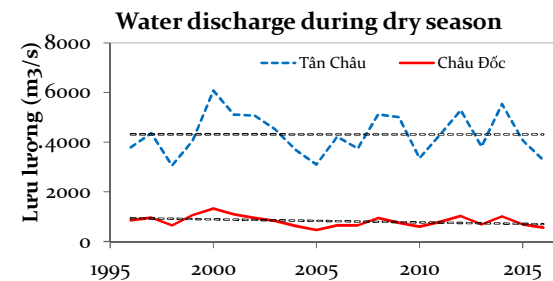
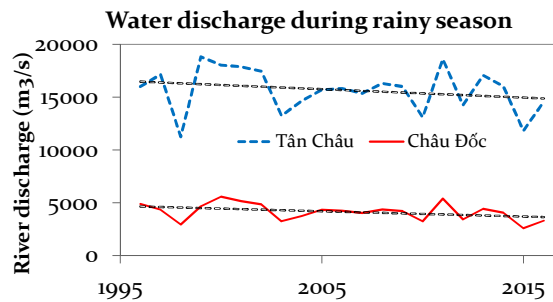
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Factor affecting sustainable development and climate change response

Reduction of water discharge in river systems



Yadu Pokhrel et al., 2018

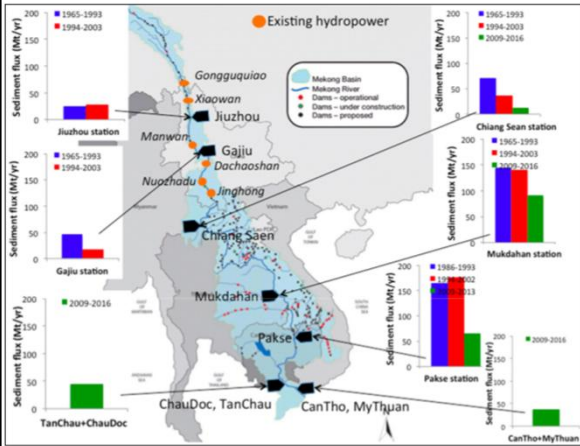


- **Total water discharge:** 1.87 billions m³/year
- **Dried season:** water flows are significantly decrease in Hau and Tien rivers

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Factor affecting sustainable development and climate change response

Reduction of suspended sediments transported by river systems



Ha et al., 2018

- **Before the dam systems were built:**
 - the suspended sediment transported by Mekong River was estimated to be 160 million tons.
- **Before the dam systems were built:**
 - After the **Manwan dam** was built, the suspended sediment in river was **significantly reduced** in the downstream of the dam
 - if all dams are being constructed and put into operation, **51%** of the suspended sediment transported by the Mekong River downstream will be reduced;
 - if all the planned dams will be constructed, **96%** of the suspended sediment transported by Mekong River will be reduced

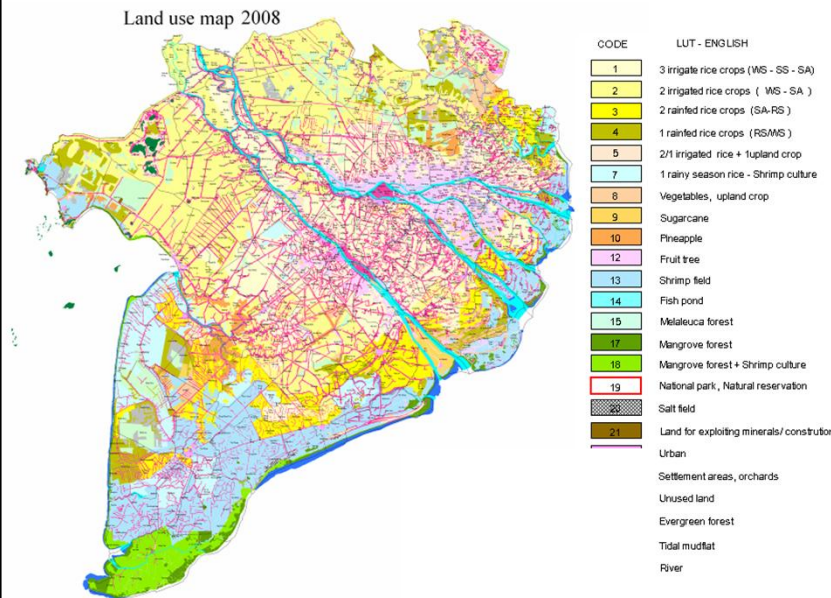
Kondolf et al., 2018

Stability of river flows, canal flows and geological and geomorphological evolution of the MD

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Factor affecting sustainable development and climate change response

Socio-economic characteristics – low adaptation to climate change



- **1990s: intensive development of rice farming**
 - Need to use >80% total water
- **After 1999s: intensive development of aquaculture farming**
- **After 2009/2010: re-identified the role of rice development**
 - Food security, implemented 3th crops

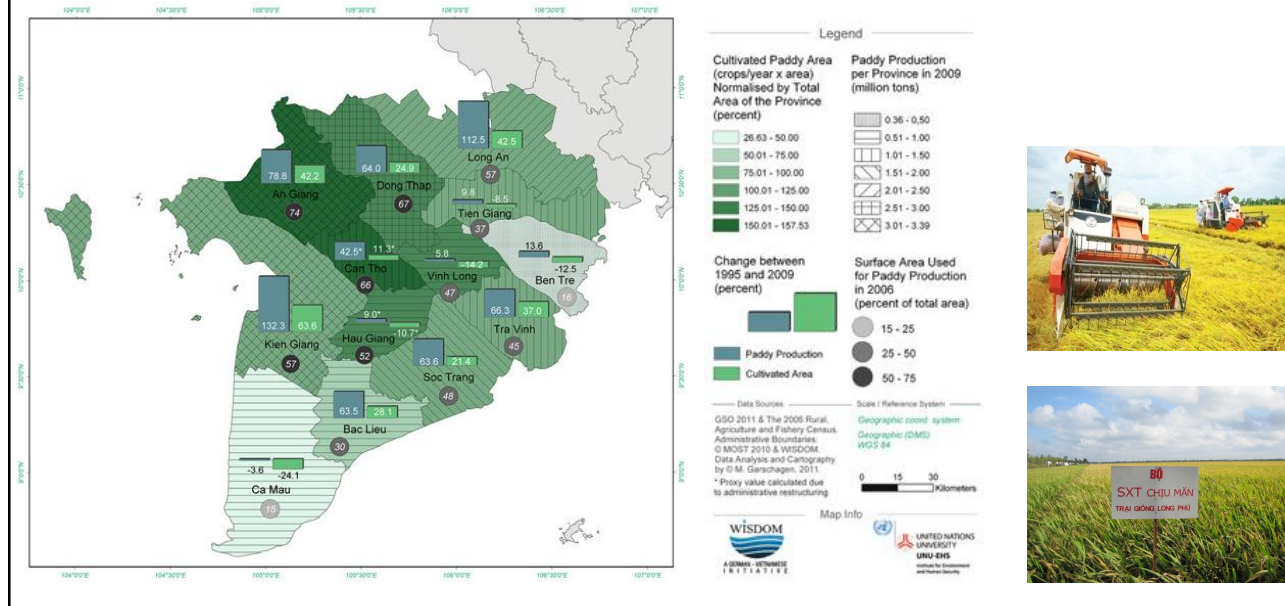


Anh: Pham Van Tra

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Factor affecting sustainable development and climate change response

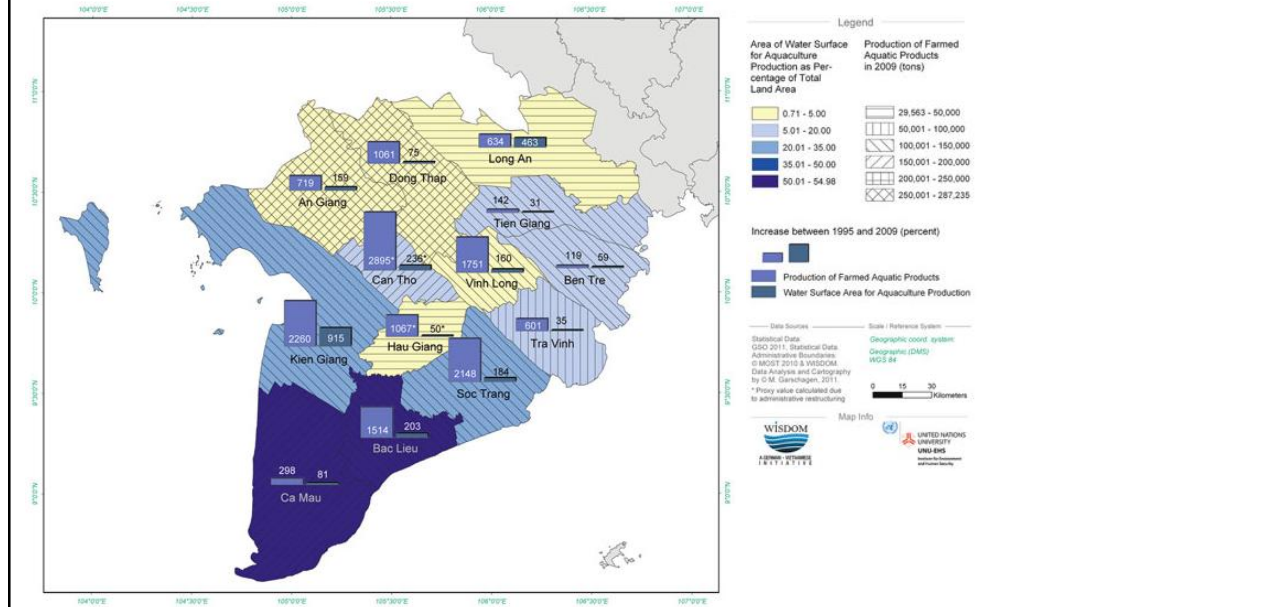
Socio-economic characteristics – low adaptation to climate change



11

Factor affecting sustainable development and climate change response

Socio-economic characteristics – low adaptation to climate change

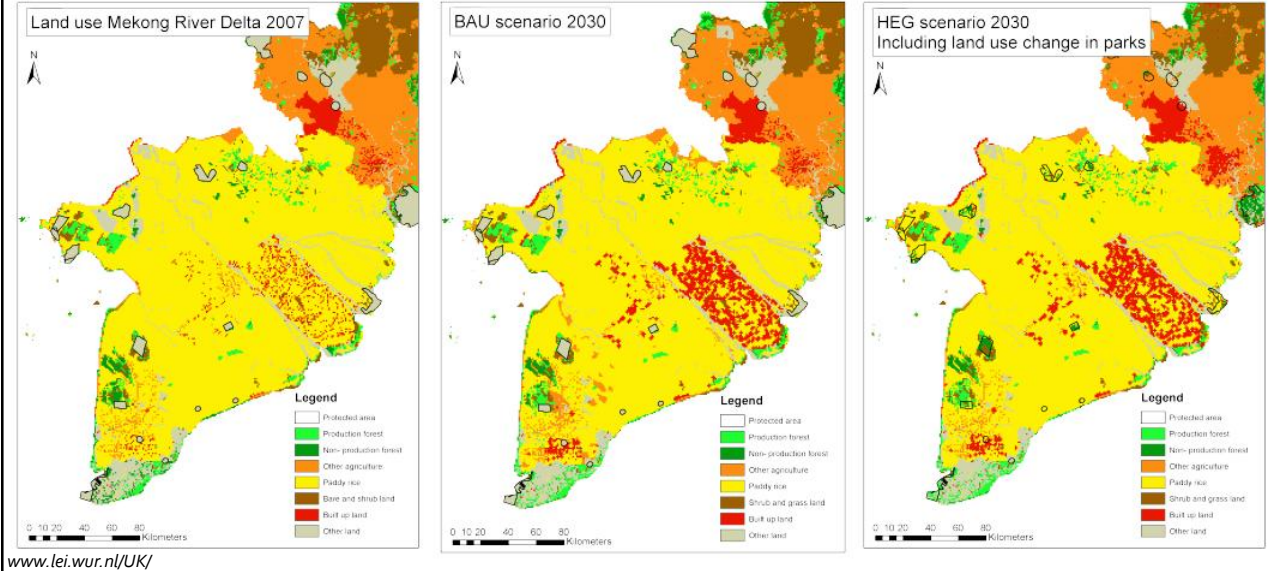


12

Factor affecting sustainable development and climate change response

Socio-economic characteristics – urbanization: reduce natural adaptation

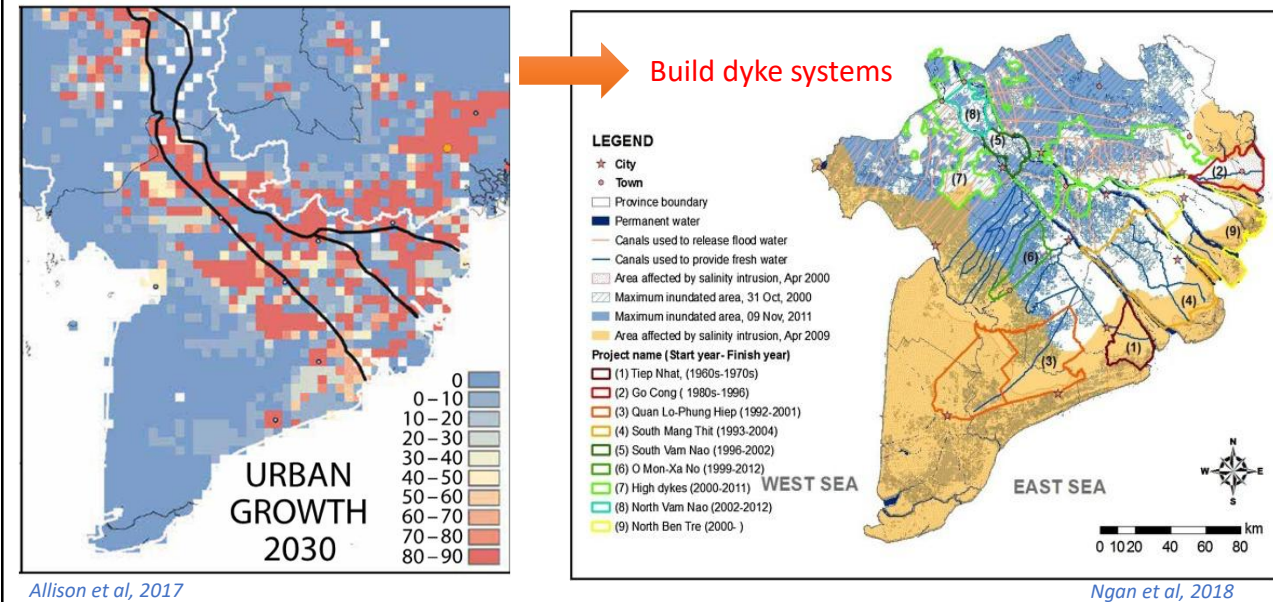
Mekong Delta



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Factor affecting sustainable development and climate change response

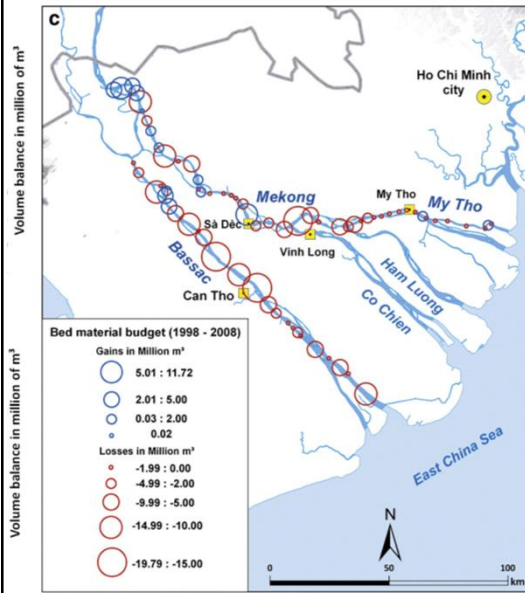
Socio-economic characteristics – urbanization: reduce natural adaptation



14

Factor affecting sustainable development and climate change response

Sand mining in the river systems



Sand mining cause:

- Land subsidence
- Erosion
- Other hazards

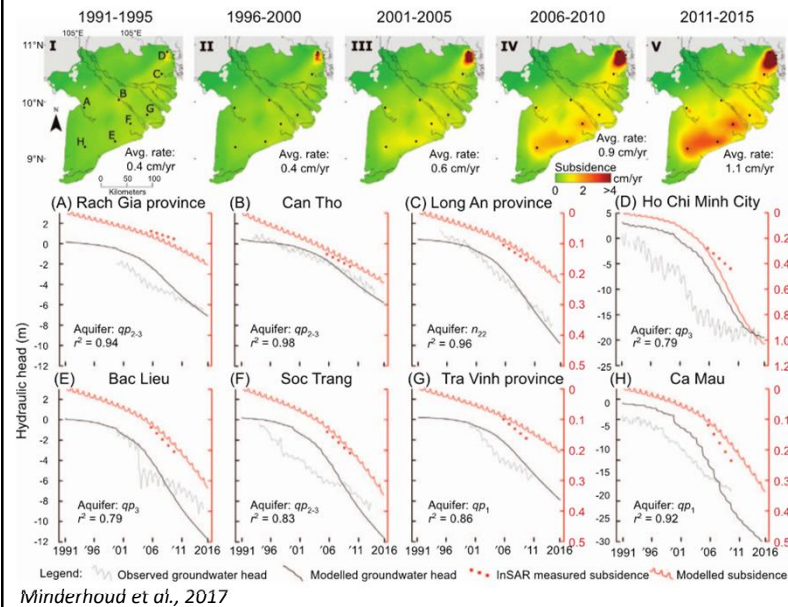
Photographs showing industrial-scale sand extraction operations in 2012 from the bed of the Bassac.

Brunier et al., 2014

15

Factor affecting sustainable development and climate change response

Impacts from groundwater extraction



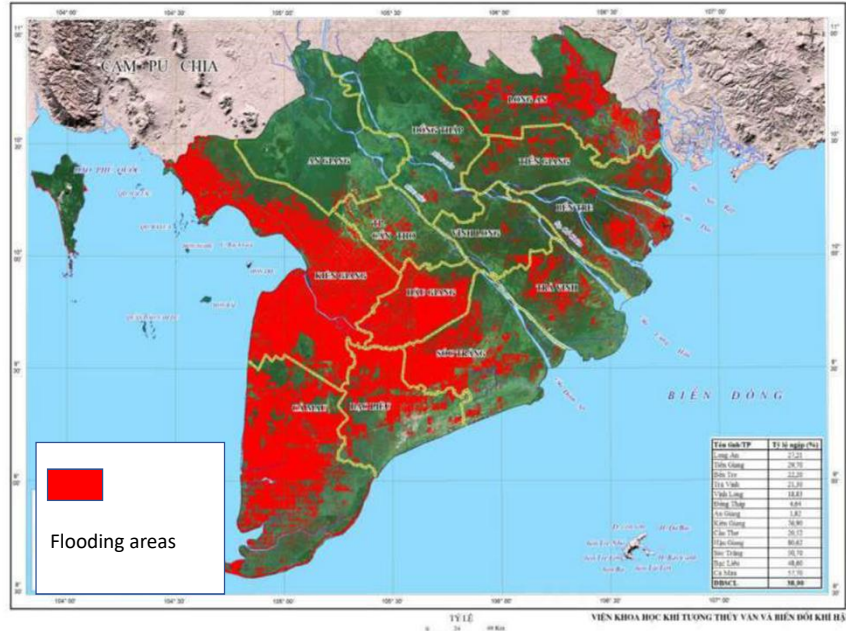
Land subsidence

Minderhoud et al., 2017

16

Climate change impacts

Sea level rise

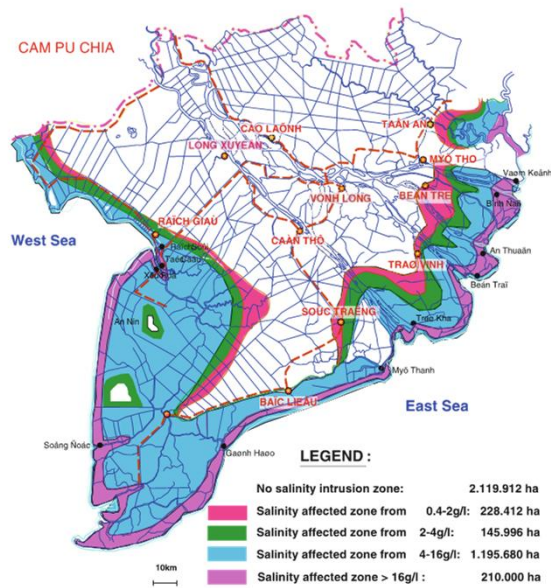


MONRE (2016)

17

Climate change impacts

Salinity intrusion

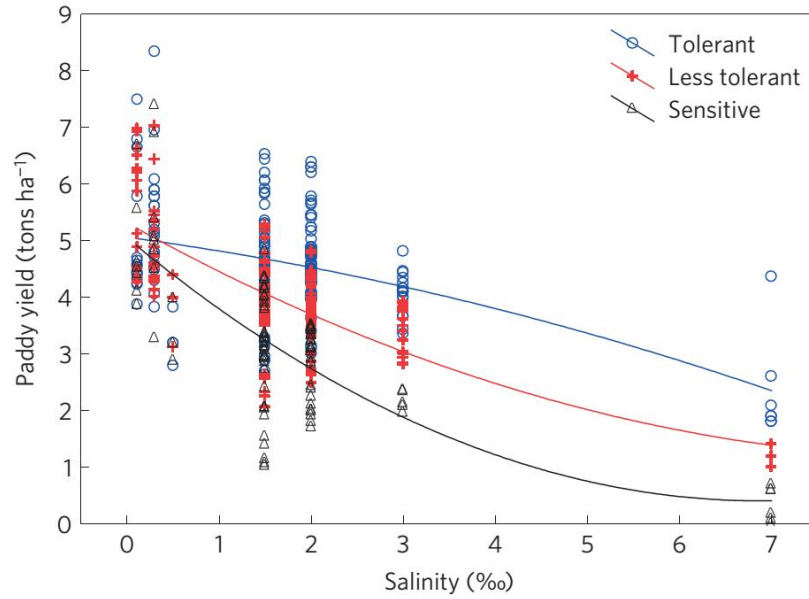


SIWRR (2010)

18

Climate change impacts

Salinity intrusion



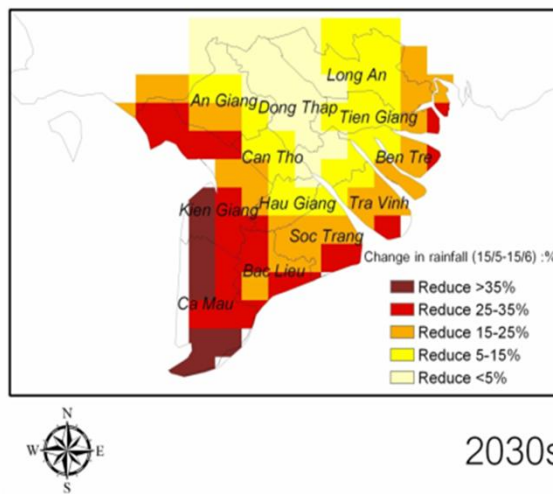
A. Smajgl (2015)

19

Climate change impacts

Climate change projection and human activities

- Sea level rise
- Climate change
- Decreasing rain levels within MK
- Increasing water utilization
- Dam building
- Drought
- Salinity intrusion



- POVERTY
- MIGRATION
- DISEASE
- CONFLICT

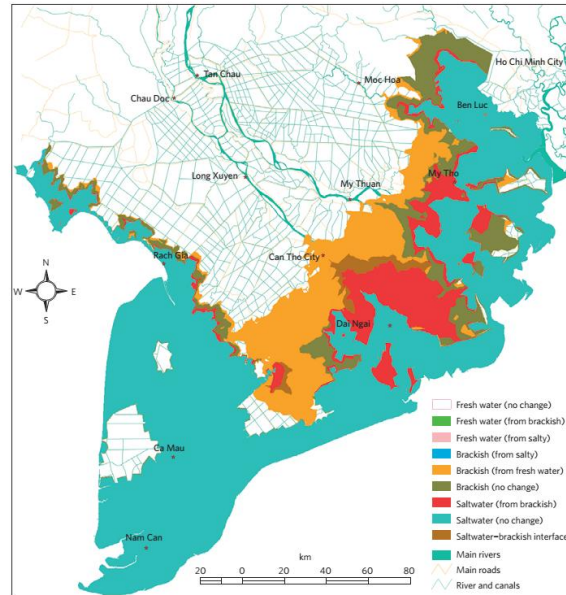
Coastal areas: the rain water level decrease significantly

20

Climate change impacts

Climate change projection and human activities

Salinity intrusion (indicated by an increasing red colouration) for the all-driver scenario, including 30 cm of sea-level rise, development of all planned upstream reservoirs and irrigation schemes, and an increase in dry years

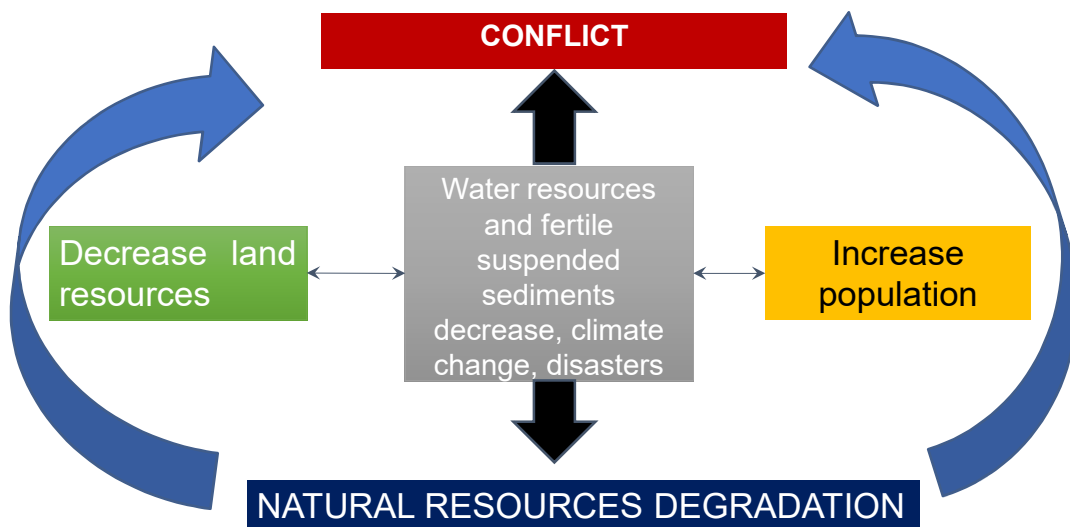


A. Smajgl (2015)

21

Climate change impacts

Projection of climate change and human activities



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Climate change impacts

Projection of climate change and human activities

POVERTY & MIGRATION

Increase the distance
between rich and poor

↕

Constrains for poverty
alleviation

Local communities don't have enough land
resources, must be migrate to find new living places

Climate change

Disasters

↕

El Nino

La Nina

↕

Extreme weather:
drought, typhoon,
floods

VN EXPRESS
Báo tiếng Việt nhiều người xem nhất

Đẹp
Với sự thẩm

tuoi tre online
VI TRƯỞNG CUỘC TRINH HỒA HỢI TỬ

Hàng trăm người miền Tây bỏ quê đi tìm việc vì 'bão hạn'
Người dân ở Sóc Trăng, Cà Mau vì hạn mặn năm nay như "con bão" cần quét qua xóm nghèo, khiến nhiều người phải bỏ xứ lên TP HCM mưu sinh.

Hạn mặn dập dờn: Dân miền Tây tha phương cầu thực
TTO - Cả cái xã Lịch Hội Thượng này, rộng ra là cả huyện, cả tỉnh, tình trạng con cái tha phương cầu thực như gia đình bà Mên lên tới cả chục ngàn, phần vì thiếu việc làm, phần vì hạn hán thiên tai...

23

Climate change impacts

Projection of climate change and human activities

POVERTY & MIGRATION

Province	Net-Migration (per 1,000)
Tây Ninh	-19.4
Bình Dương	340.4
Dong Nai	66.1
Ho Chi Minh City	135.7
Long An	-19.7
An Giang	-45.9
Dong Thap	-45.4
Tien Giang	-42.8
Can Tho	3.2
Vinh Long	51.8
Ben Tre	66.8
Ta Van	60.7
Kien Giang	-33.6
Hau Giang	-37.5
Soc Trang	-47.5
Bac Lieu	-46.5
Cà Mau	67

Legend

Net-Migration within 5 Years prior to April 2009 (Migrants per 1,000 Inhabitants)

	-66.8 - -50.0		5.1 - 25.0
	-49.9 - -25.0		25.1 - 100.0
	-24.9 - 0.0		100.1 - 150.0
	0.1 - 5.0		150.1 - 340.4

Interpretation

The Map shows that apart from Can Tho City all provinces in the Mekong Delta have been experiencing net-outmigration over the last five years. This means that these provinces experience more out-migration than in-migration. The major destination of migrants from the Mekong Delta is HCMC, Dong Nai Province and Binh Duong Province. The latter has experienced a net-in-migration of 340 persons per 1,000 inhabitants over the last five years.

Data Source: Statistical Data on Migration: 2010. The 2009 Vietnam Population and Housing Census. Administrative Boundaries. © MOET 2010 & WISDOM. Data Analysis and Cartography by G.M. Genschehen, 2011.

Scale: Reference System: Geographic coord. system: Geographic (GMS) WGS 84

Map Info: WISDOM, UNITED NATIONS UNIVERSITY, UNU-EHS

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12

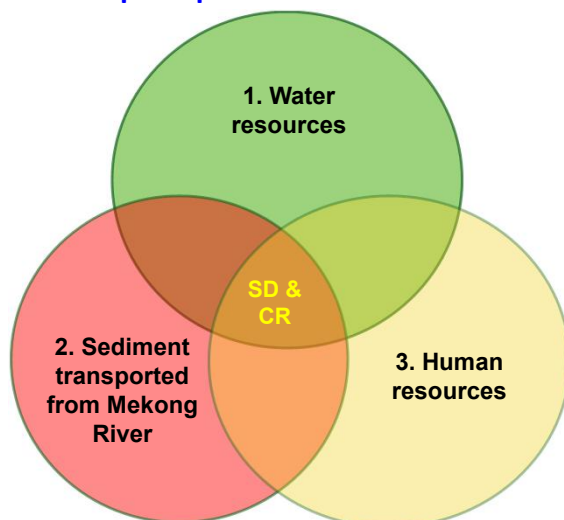
Quiz

- Can you give some ideas to increase the climate security of Mekong Delta?
 - Adaptation
 - Mitigation

25

Orientations, models and solutions to towards sustainable development in the Mekong delta

General principles



SD: Sustainable development
CR: Climate change response

WATER RESOURCES/SEDIMENT TRANSPORTED FROM MEKONG RIVER

- Are decreasing
- Related hazards are increasing in both scale and intensity: sea level rise, river bank erosion, shoreline erosion, land subsidence, salinity intrusion
- Benefits and challenges from sea water/brackish water resources are increasing to impact significantly, leading to shift the coastal and estuarine ecosystems
- Human activities at the upstream of Mekong river are difficult to predict and control

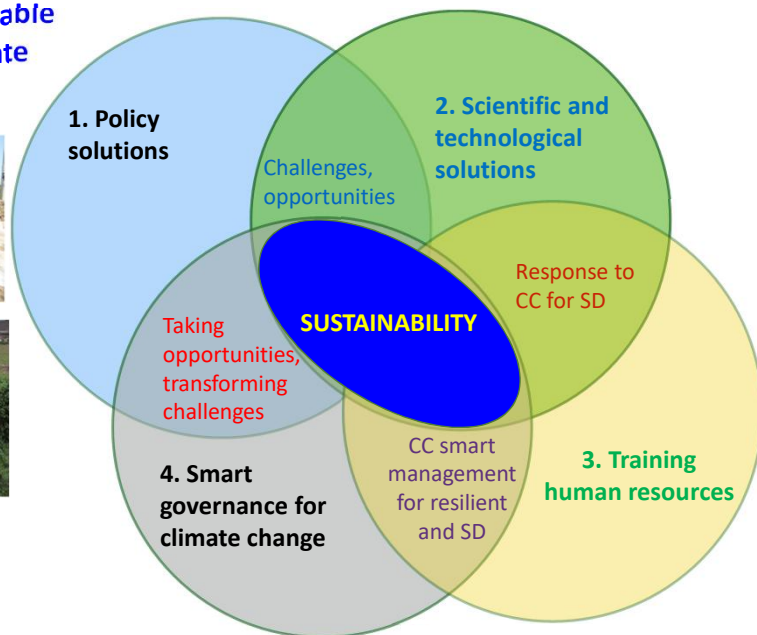
HUMAN RESOURCES

- Management and utilization of natural resources and better response to challenges of climate change;

26

Orientations, models and solutions to towards sustainable development in MD

Recommended solutions for sustainable development in the context of climate change



SD- sustainable development

CC- Climate change

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Conclusions

- **The MD has an evolution based on a "dynamic system"**
 - Major components to stabilize its natural development: water flow and sediments transported by the Mekong river system.
- **These natural processes have been occurring for the last 8,000 years, but will be strongly affected by:**
 - A decline in river flow from the upstream,
 - Increase sea level rise and human activities
 - Main impacts from climate change and human activities: dam construction, sand mining and water utilization
 - Sea level rise, climate change, natural hazards.
- **Recommended solutions for sustainable development in the context of climate change**
 - Policies, scientific and technological solutions, education and training human resources and smart governance.
 - Promote extensively and comprehensively diplomatic solutions and international cooperation
- **Building MD "Smart Water Resources governance"** for sustainable development.

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Module 3

Climate change mitigation solutions in Vietnam

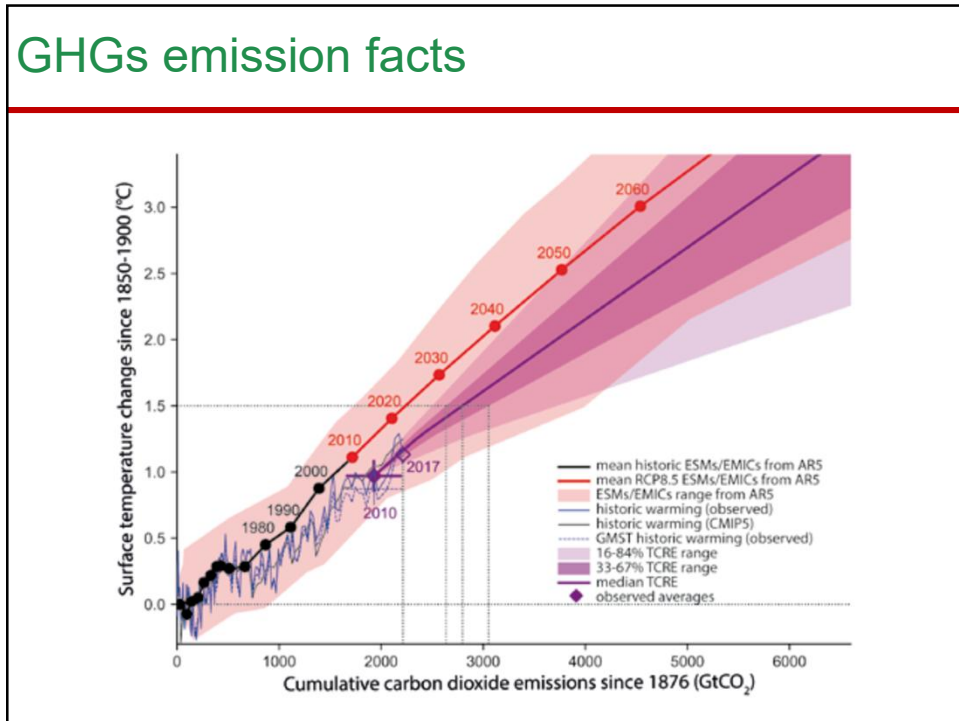
61

Quiz?

- **What is climate change mitigation?**
- **What is Vietnam doing for mitigating climate change?**

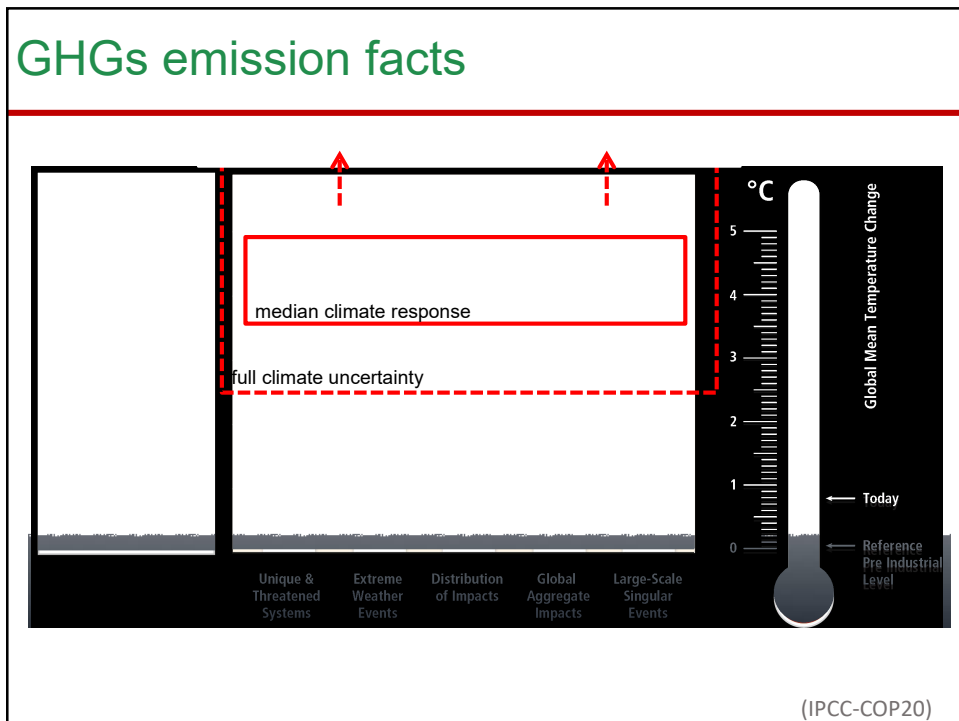
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GHGs emission facts

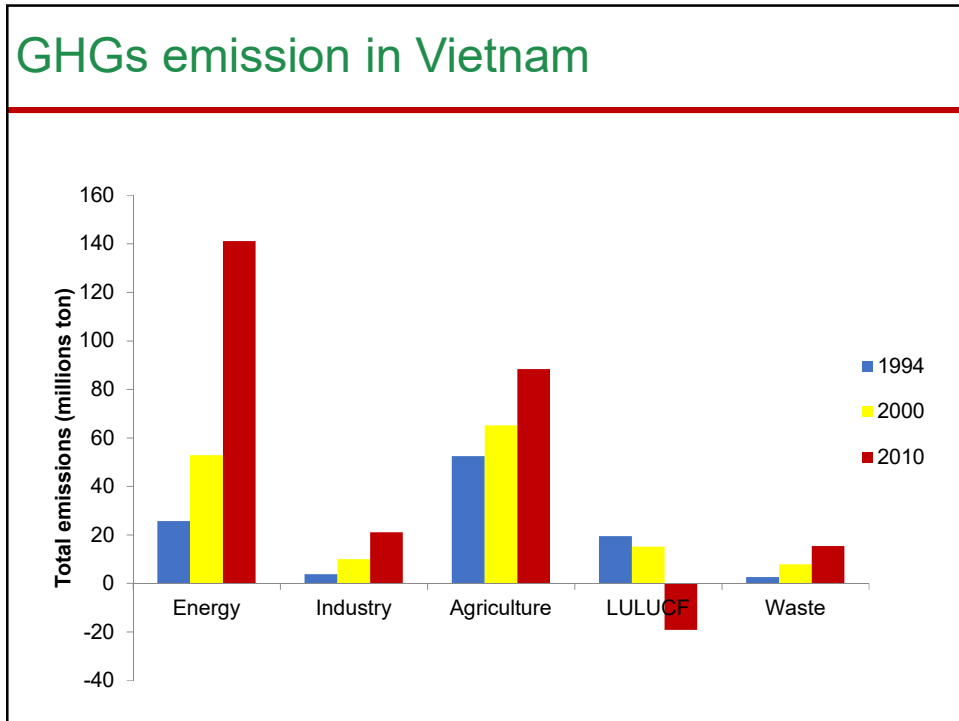


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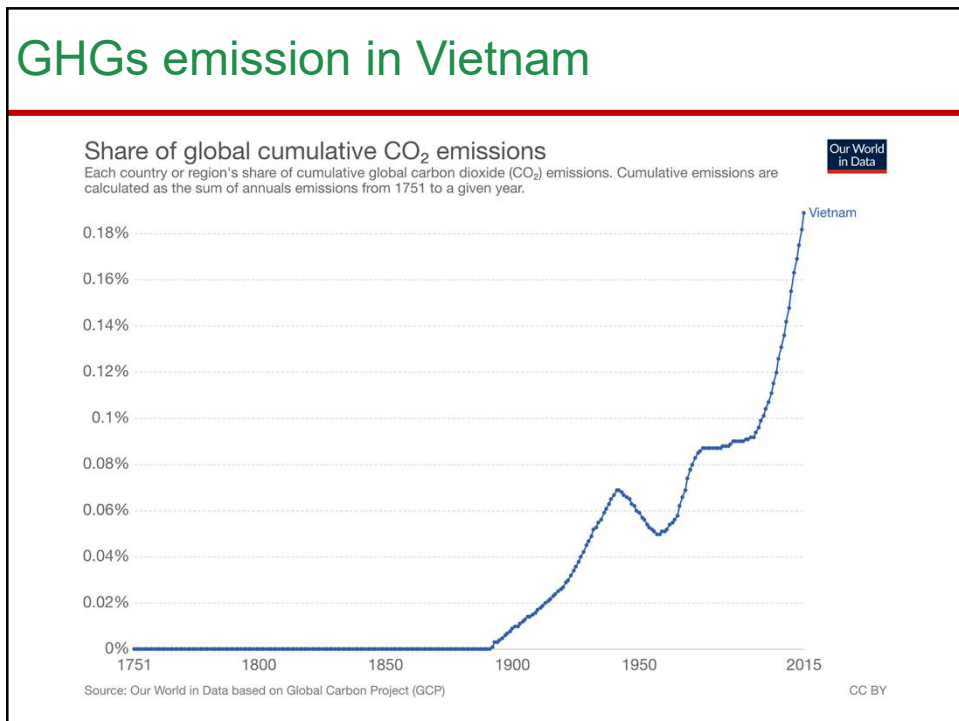
GHGs emission facts



64



65



66

Reducing GHGs emission in Vietnam

- **Developing new and recycled energies**
 - To review, plan and develop hydroelectric projects properly for various purposes, so that the total output capacity of hydroelectric plants can reach 20,000-22,000 MW by 2020;
 - To renewable energy:
 - wind energy, solar energy, tidal energy, geothermal energy, biofuel, and universal energy;
 - implement policies on engaging socio-economic sectors in applying and popularizing renewable energies;
 - raise the percentage of renewable energy to 5% of the totality of energies by 2020 and 11% by 2050.

67

Reducing GHGs emission in Vietnam

- **Saving and effectively using energies**
 - To restructure the economy through narrowing energy-intensive industries and developing energy-efficient ones;
 - To design and implement policies which support and encourage the effective use of energies in economic fields, especially in transportation, urban development, industry, and agriculture; to check and reject ineffective technologies which largely consume energies and create greenhouse gases. Up to 2015, the plan on rejecting ineffective technologies must be finalized and issued;
 - To research, develop and apply technologies, equipment and consumer goods which use energies effectively, consume non-fossil energies and create low emission, especially in transportation, urban development, industry and agriculture;
 - To set up a sound energy valuing system for effectively using and saving energies and for development of new and recycled. A new energy valuing system must be issued in 2015;
 - To introduce advanced technologies for increasing the output of electricity generation and reducing greenhouse gas emission at all newly-built thermoelectric plants; to apply small-scale electricity generating systems which use methane collected from dumping sites and other sources; to collect gases and make full use of redundant heat of industrial production factories for discovering and burning solid wastes for electricity generation;
 - To improve the economical use and preservation of energies; to monitor and supervise the use of energy in energy-intensive industries; to apply standards on energy efficiency to energy-saving products and systems.

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Reducing GHGs emission in Vietnam

• Industrial production and construction:

- To research and apply new technologies of low greenhouse gas emission in industrial production; to speed up the replacement of fossil fuels with low-carbon ones; to popularize cleaner production, so that by 2020, 90% of industrial production facilities must use cleaner technologies and save energies, fuels, and materials;
- To enhance research and development of high technologies in key industries; by 2020, the added value of hi-tech industries must be raised to 42-45% of the total industrial production; to boost technological renovation through adopting high technologies and renewing 20% of machinery and equipment by 2020. The production value of hi-tech industries must be raised to 80% by 2050;
- To put forth and apply technical standards and norms of effective energy use in the production of materials and to construction projects.

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Reducing GHGs emission in Vietnam

• Transportation:

- To plan the system of transportation and improve its quality to international standards; to develop means of public transport in urban areas while controlling the growth of individual means of transport. By 2020, the system of public transport must in the main satisfy the society's demand for transportation. The modernization of a nationwide transport network and externally-orientated transport corridor must be completed by 2050;
- To introduce fuels of low greenhouse gas emission to means of transport; to encourage buses and taxis' consumption of compressed natural gas and liquefied gas, so that 20% of these vehicles will use such energies by 2020 and 80% by 2050;
- To set up and apply mechanisms and policies encouraging the use of energy-saving vehicles while getting rid of energy-intensive ones.

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Reducing GHGs emission in Vietnam

- **Agriculture**

- To change methods of agricultural cultivation, use water, fertilizers and cattle-feed properly, manage and treat wastes from husbandry activities, develop and use biogas as fuels, reduce and reject out-of-date energy-intensive agricultural machinery.
- To boost green agricultural production of low emission in order to guarantee sustainable development and national food security as well as facilitate poverty reduction: The reduction of greenhouse gas emission, agricultural growth rate and poverty reduction should be maintained at 20% every 10 years.

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Reducing GHGs emission in Vietnam

- **Waste management**

- To make planning schemes for waste management in order to minimize recycle and reuse wastes for lower emission of greenhouse gases;
- To promote research and introduction of advanced waste treating technologies; to apply modern waste treating technologies in urban and rural areas; to strengthen the management, treatment and reuse of industrial and domestic sewage; by 2020, 90% of the total volume of urban domestic solid wastes should be gathered and treated, in which 85% is recycled and reused.

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Module 4

Development of smart model in the context of climate change

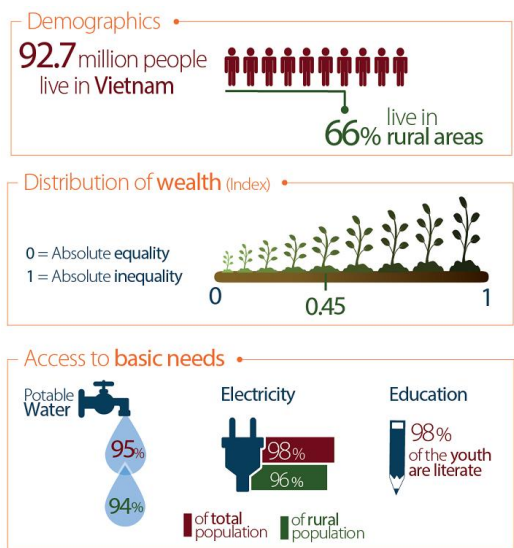
73

Climate smart agriculture in Vietnam

- Climate-smart agriculture (CSA) is an approach that helps to guide actions needed to **transform** and **reorient** agricultural systems to effectively support development and **ensure food security** in a changing climate.
- CSA aims to tackle three main objectives:
 - sustainably increasing agricultural productivity and incomes;
 - adapting and building resilience to climate change;
 - reducing and/or removing greenhouse gas emissions, where possible.
- CSA provides the means to help stakeholders from local to national and international levels identify **agricultural strategies** suitable to their local conditions.

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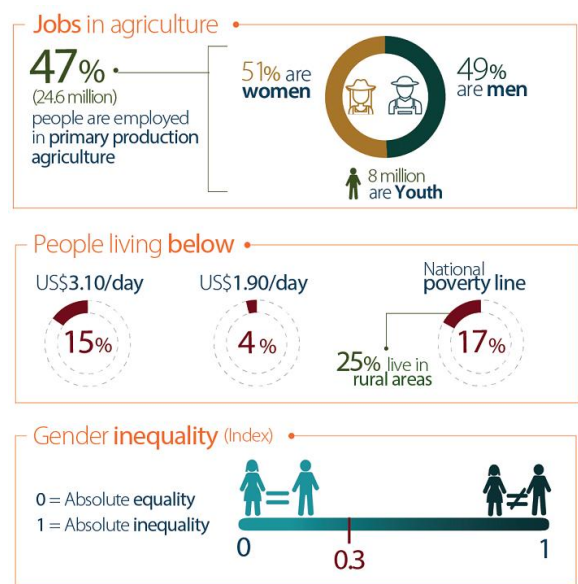
Factors affecting food agriculture development in Vietnam



Nguyen et al. (2017)

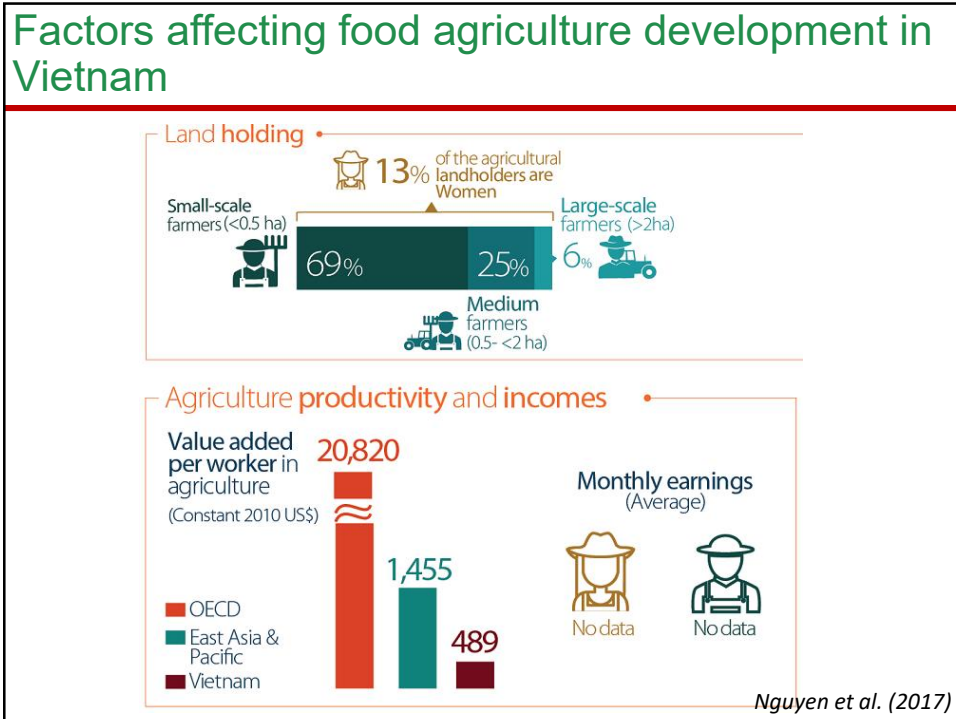
75

Factors affecting food agriculture development in Vietnam

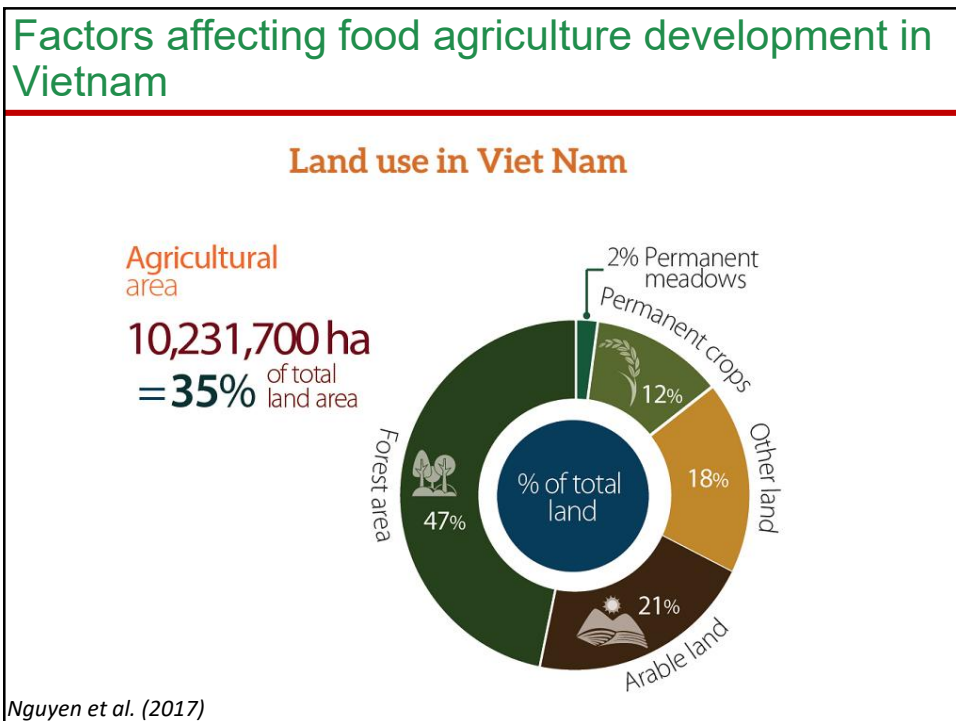


Nguyen et al. (2017)

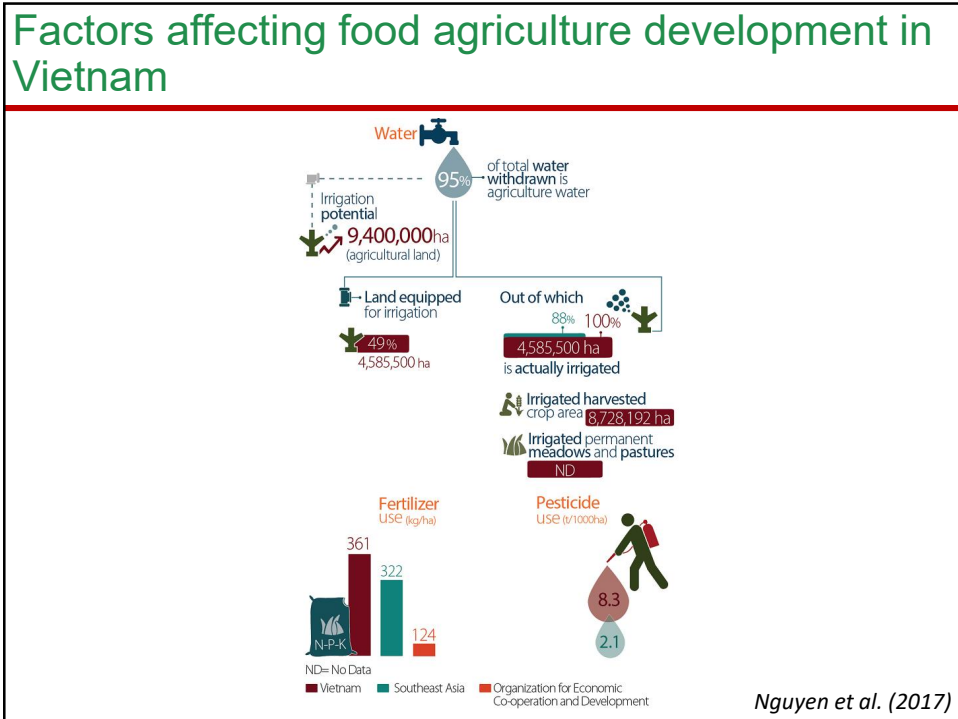
76



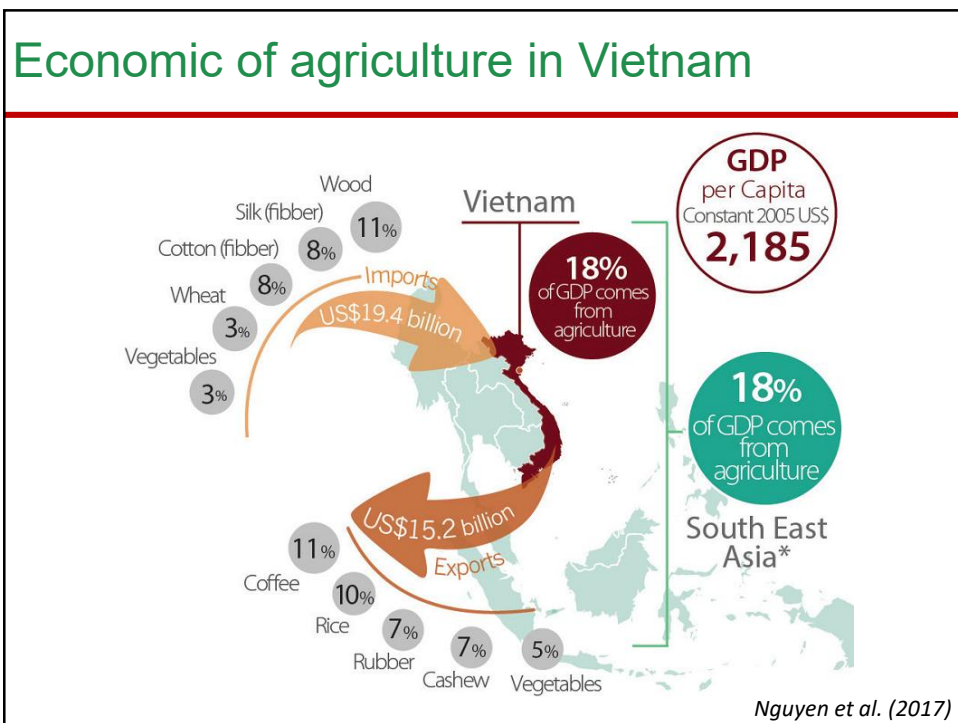
77



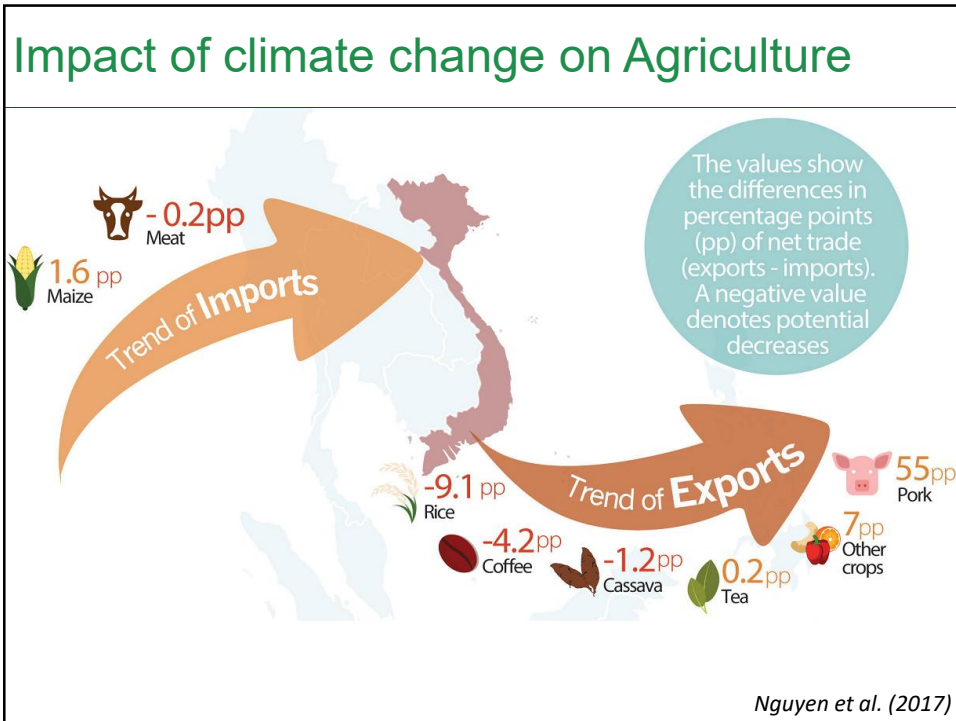
78



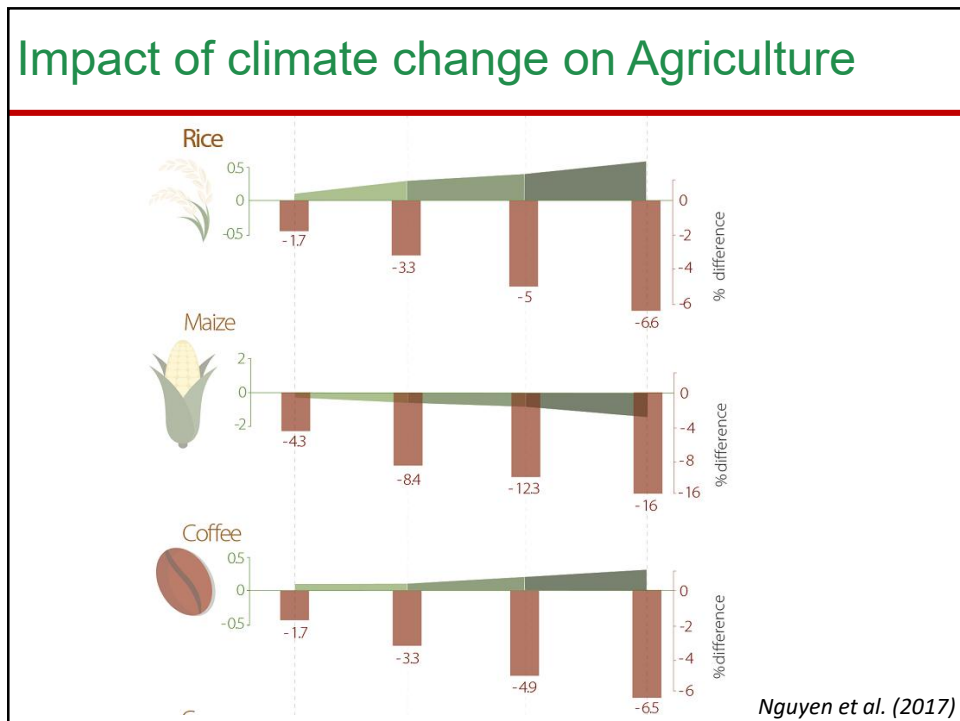
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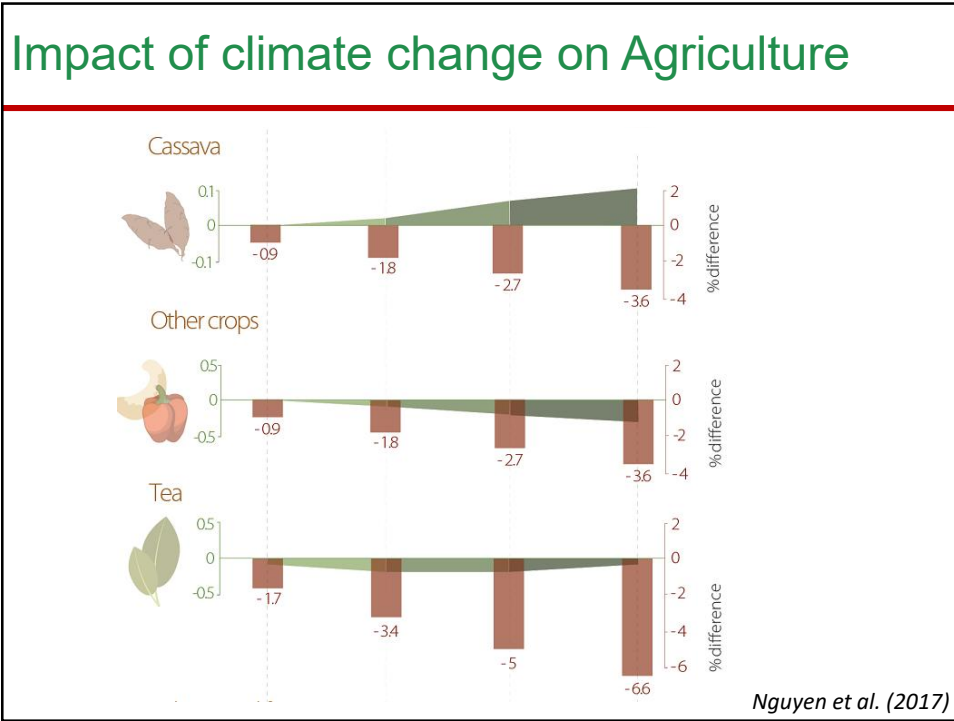
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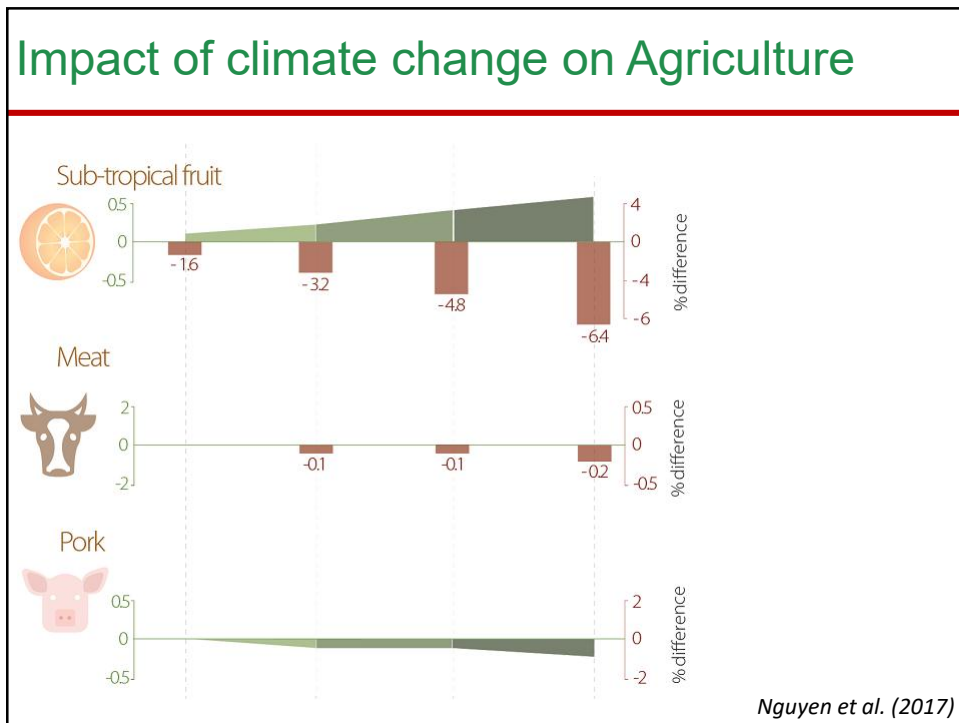
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Climate smart agriculture practices

- **Smart water and irrigation management**

- installing water saving irrigation techniques
 - drip or sprinkler irrigation

Ninh Phuoc district, Ninh Thuan province



85

Climate smart agriculture practices

- **Smart water and irrigation management**

- installing water saving irrigation techniques
 - drip or sprinkler irrigation

Ninh Hai district, Ninh Thuan province



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Climate smart agriculture practices

- **Smart water and irrigation management**
 - installing water saving irrigation techniques
 - drip or sprinkler irrigation

Coffee farm
DakLak province



87

Climate smart agriculture practices

- **Smart water and irrigation management**
 - implementing moisture-preserving practices
 - mulching (cassava)



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Climate smart agriculture practices

• Smart water and irrigation management

- alternate wetting and drying (AWD) systems in rice
- input-saving techniques in rice production



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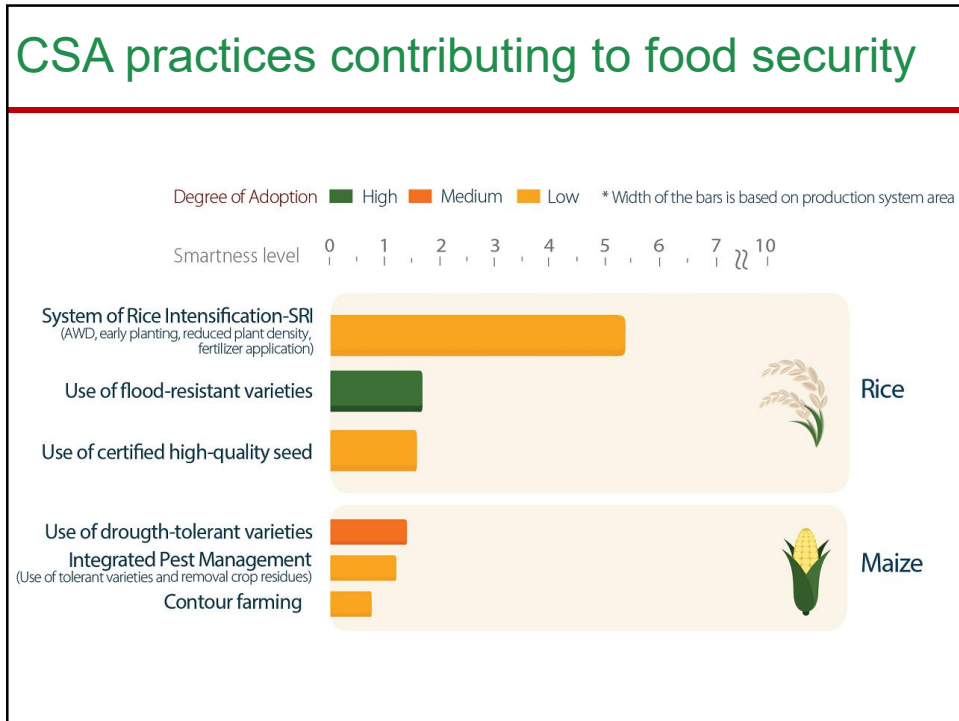
Climate smart agriculture practices

• Smart water and irrigation management

- alternate wetting and drying (AWD) systems in rice
- input-saving techniques in rice production



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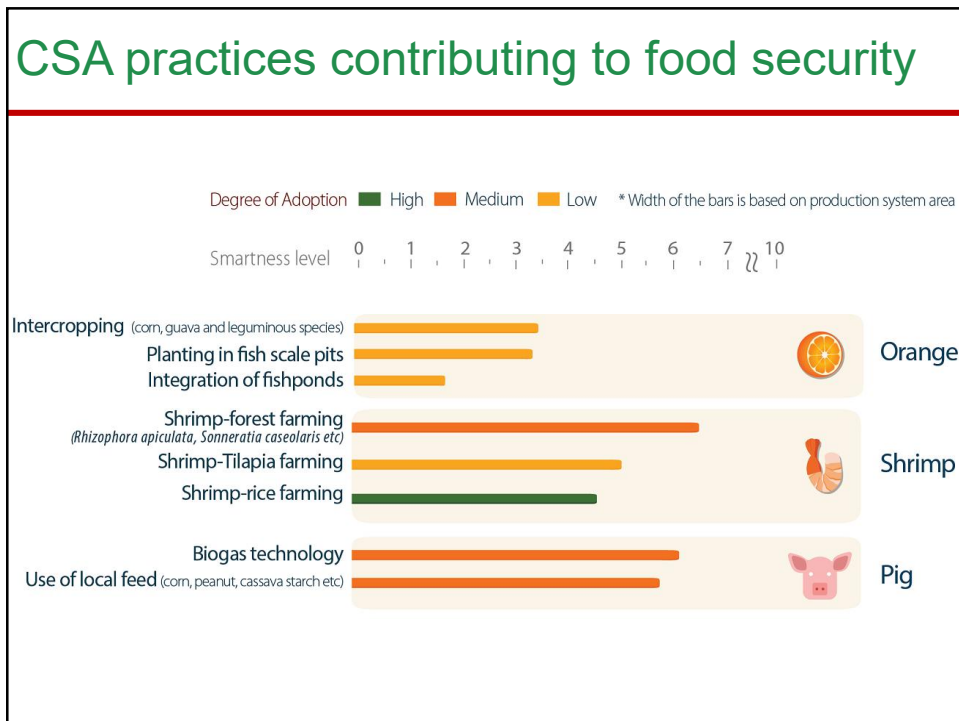
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CSA practices contributing to food security

CSA practice	Region and adoption rate (%)			Predominant farm scale S: small scale M: medium scale L: large scale	Climate smartness	Impact on CSA Pillars
	<30	30-60	60>			
Rice (77% of total harvested area)						
System of Rice Intensification- SRI (AWD, early planting, reduced plant density, fertilizer application)	Red river delta	30-60%		S		Productivity Increase yield. Adaptation Increase resistance to unfavorable condition: drought, flood, disease. Mitigation Mitigate GHG emissions.
	Mekong river delta	30-60%		S		

95

CSA practices contributing to food security

CSA practice	Region and adoption rate (%)			Predominant farm scale S: small scale M: medium scale L: large scale	Climate smartness	Impact on CSA Pillars
	<30	30-60	60>			
Use of flood-resistant varieties	Notern mountain	60%>		M		Productivity Increase land and crop productivity per unit of water. Adaptation Increase resistance to heavy rains or flood. Mitigation Provide moderate reduction in GHG emissions per unit of food produced.
	Red river delta	60%>		S M L		

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CSA practices contributing to food security

CSA practice	Region and adoption rate (%)			Predominant farm scale S: small scale M: medium scale L: large scale	Climate smartness	Impact on CSA Pillars
	<30	30-60	60>			
Maize (11% of total harvested area)						
Use of drought-tolerant varieties	Central Highland	30-60%		M	1.3	Productivity Increase yield. Adaptation Maize varieties can adapt to local conditions given the water shortage. Mitigation NA.
	Northern midlands and mountainous	30-60%		M		
Integrated pest management (use of tolerant varieties and removal of crop residues)	Northern midlands and mountainous	<30%		S	1.2	Productivity Increase yield. Adaptation Resistant to pests & diseases, increase/improve biodiversity. Mitigation NA

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CSA practices contributing to food security

CSA practice	Region and adoption rate (%)			Predominant farm scale S: small scale M: medium scale L: large scale	Climate smartness	Impact on CSA Pillars
	<30	30-60	60>			
Water saving irrigation (sprinkler, micro sprinkler)	South East	30-60%		S M L	3.5	Productivity Maintain yield. Adaptation Adapt to drought. Mitigation Reduce emissions from using machines.
	Central Highland	30-60%		S M L		
Intercropping with perennial crops (durian, avocado, black pepper, cassia siamea)	Central Highland	30-60%		S M L	2.3	Productivity Increase total yield per unit of area. Adaptation Resistant to salt intrusion and reduce impacts from storms. Mitigation Increase carbon sequestration.
	South East	30-60%		S M L		

Coffee

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CSA practices contributing to food security

CSA practice	Region and adoption rate (%)	Predominant farm scale S: small scale M: medium scale L: large scale	Climate smartness	Impact on CSA Pillars
Shrimp (6% of total harvested area)				
Shrimp-forest farming (mangrove species: Rhizophora apiculata, Sonneratia caseolaris and others)	Mekong river delta 30-60%	L		<p>Productivity Increase productivity of shirmp and forestry products.</p> <p>Adaptation Salinity resistant, reduce impacts from storms etc.</p> <p>Mitigation Increase carbon sequestration.</p>
Shrimp-Tilapia farming	Mekong river delta <30%	S		<p>Productivity Reduce production risks.</p> <p>Adaptation Reduce unfavorable conditions for shirmp or tilapia.</p> <p>Mitigation NA.</p>

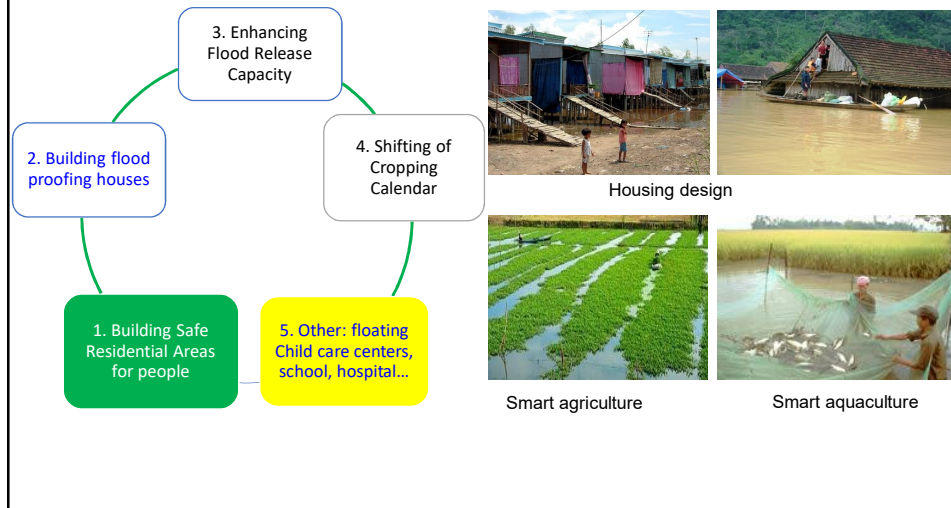
99

Quiz

- **What will you do to contribute CSA in Vietnam?**
 - Research & Development (R&D)
- **What are the opportunities and challenges of CSA in Vietnam?**
- **What are the methods to evaluation the smartness of CSA?**

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Smart response model to floods



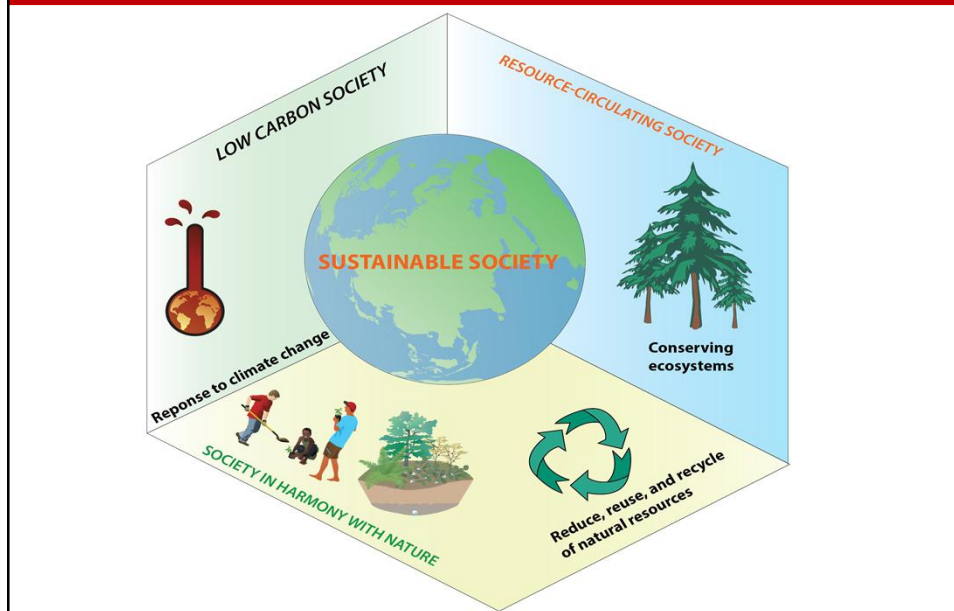
101

Low-carbon societies development in Vietnam

- **More efficient use of energy**
 - Building design and systems
 - Industrial processes
 - Transportation systems
 - Electric power systems
- **Reducing demand for energy-intensive goods & services**
- **Greater use of low-carbon and Zero-carbon energy**
 - Increasing use of Renewable energies: solar, wind, water, biofuel, hydrothermal energy, ...
 - Natural gas;
 - Grid-charged batteries for ground transportation
 - Heat pumps for building furnaces and boilers
- **Improved carbon sinks**
 - Reduced deforestation and improved forest management and planting of new forests, especially mangrove
 - Capture and sequester CO₂ directly from ambient air to geological structure and formation: assessed the high potential areas....
- **Lifestyle and behavioural changes**

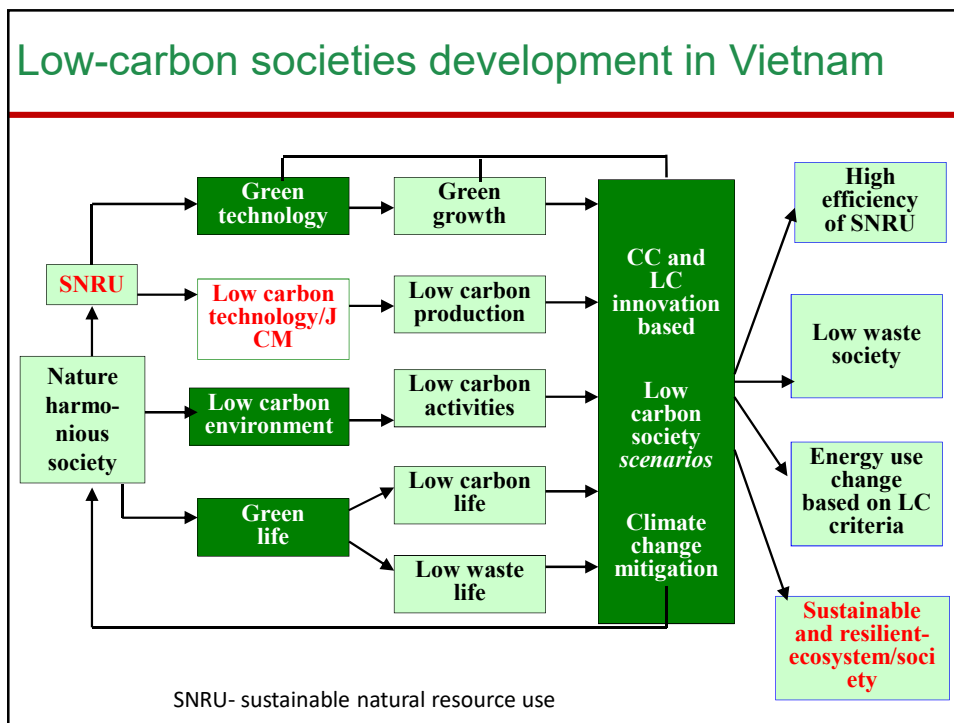
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Low-carbon societies development in Vietnam



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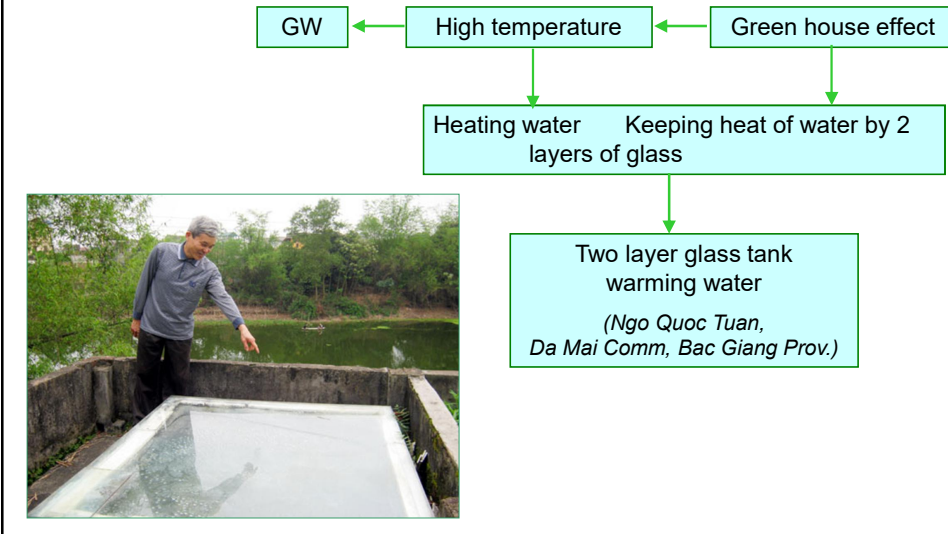
Low-carbon societies development in Vietnam



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Low-carbon societies development in Vietnam

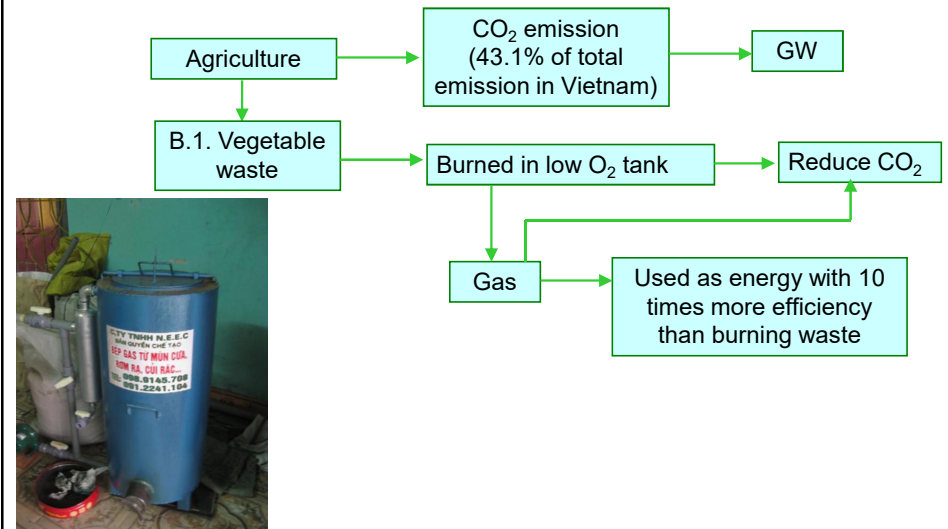
Smart Water warming systems – Saving energy



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Low-carbon societies development in Vietnam

Transferring agriculture waste into gas



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Low-carbon societies development in Vietnam

Transferring agriculture waste into gas

B.2. Other organic waste
(manure, sewage,...)

Biotechnology (breakdown of
organic matter in the absence
of oxygene)

130.000 biogas
cellars built

Biogas (~510,952
carbon certificates)

Decreasing 5 tons CO₂ /
household / year



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Module 5 Scientific and technological solutions

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Scientific and technological solutions

Investment in Renewable energy



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Type of Energy	Current FIT	Offtake Period	Type of project	Regulation	Effective date
Wind	8.5 cents	20 years	Onshore	Circular No. 02	28/2/2019
Wind	9.8 cents	20 years	Offshore	Circular No. 02	28/2/2019
Biomass	5.8 cents	20 years	Combined Heat Power Technology	Decision 24/2014	10/5/2014
Biomass	7.3 – 7.5 cents	20 years	avoided cost tariff for other technologies	Decision 24/2014	10/5/2014
Waste to Energy	10.05 cents	20 years	Direct burning/Incineration	Decision 31/2014	20/6/2014
Waste to Energy	7.28 cents	20 years	Biogas from landfill	Decision 31/2014	20/6/2014
Solar	9.35 cents	20 years	on-grid solar power projects that achieve commercial operation date (“COD”) prior to 30 June 2019 (except projects in Ninh Thuan province)	Decision 11/2017	From 1/6/2017 to 30/6/2019
Solar	6.67 to 10.87 cents (still under proposed stage)	20 years	depending on the type and location of the project. The new regulation divided the FIT into 04 zones	New tariffs have been proposed, which are currently under discussion	from 1 July 2019 through 30 June 2021.

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Low-carbon societies development in Vietnam

• Wind energy

- Bac Lieu province: nearshore
- Tuy Phong district, Binh Thuan province:

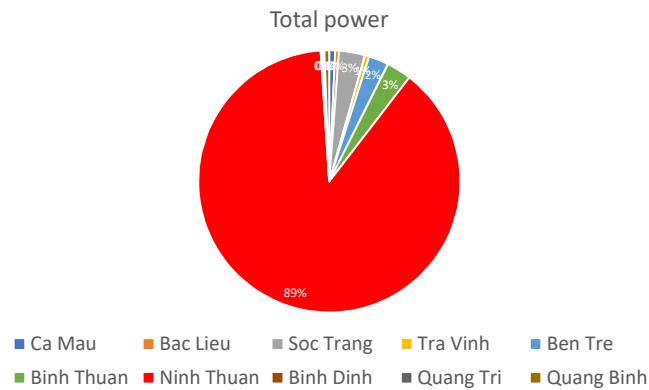
Province	n	Total power (MW)
Ca Mau	5	350
Bac Lieu	2	241.2
Soc Trang	6	1578
Tra Vinh	6	270
Ben Tre	11	1230
Binh Thuan	26	1516.5
Ninh Thuan	5	43903.2
Binh Dinh	3	112.1
Quang Tri	4	110
Quang Binh	2	300
Total	70	49611

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Low-carbon societies development in Vietnam

• Wind energy

- Bac Lieu province: nearshore
- Tuy Phong district, Binh Thuan province:



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Low-carbon societies development in Vietnam

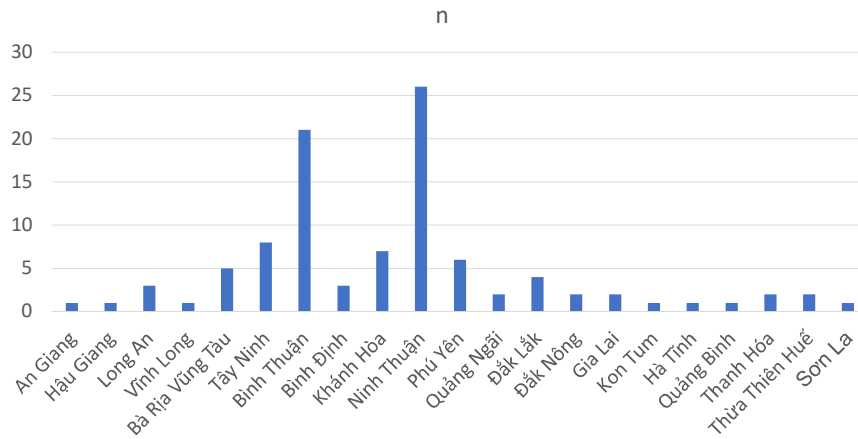
Investment in Solar energy



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Low-carbon societies development in Vietnam

Investment in Solar energy



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Low-carbon societies development in Vietnam

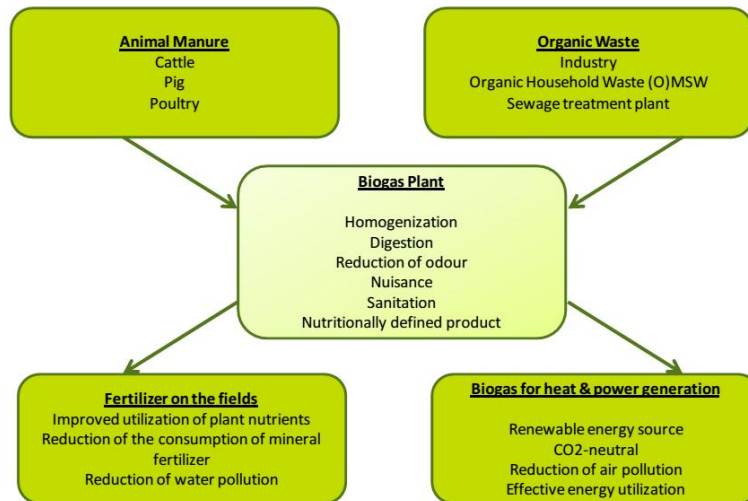
Investment in biomass energy

- What is biomass energy? Can you give some examples?

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Low-carbon societies development in Vietnam

Investment in biomass energy



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Low-carbon societies development in Vietnam

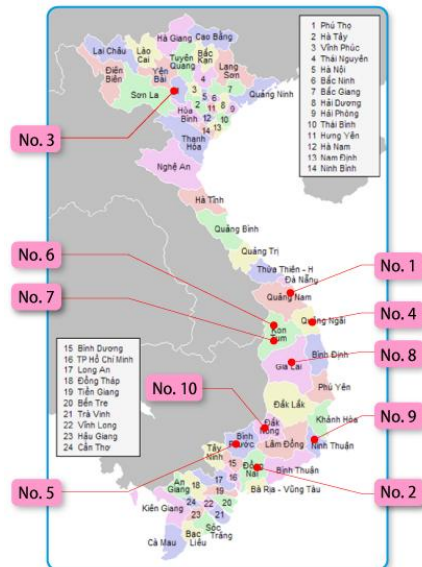
Investment in biomass energy



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Low-carbon societies development in Vietnam

Investment in biofuel



https://www.asiabiomass.jp/english/topics/1105_03.html

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Quiz

- Do you think the development of wind energy/solar energy will has some positive and negative impacts on **national security** of Vietnam?

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Quiz

Conflicts of local people

Dự án nhà máy điện mặt trời đầm Trà Ô có ảnh hưởng đến dân sinh?

Đối thoại với những người dân phản đối dự án điện mặt trời đầm Trà Ô, Phó chủ tịch UBND tỉnh Bình Định khẳng định dự án không ảnh hưởng đến môi trường và sinh kế của người dân.



Người dân xã Mỹ Lợi trình bày ý kiến tại buổi đối thoại - ANH: HOÀNG TRỌNG

Ngày 2.4, Phó chủ tịch UBND tỉnh Bình Định Trần Châu đã chủ trì buổi đối thoại với người dân xã Mỹ Lợi (H.Phù Mỹ, Bình Định) về các vấn đề liên quan đến Dự án Nhà máy điện mặt trời đầm Trà Ô.

Lấy đầm, dân làm gì để sinh sống?

Tại buổi đối thoại, nhiều người dân vẫn bức xúc, phản đối Dự án Nhà máy điện mặt trời đầm Trà Ô. Nhiều ý kiến cho rằng việc xây dựng nhà máy điện mặt trời sẽ làm mất sinh kế của hàng trăm hộ dân chuyên đánh bắt, nuôi trồng thủy sản trên đầm. Vì vậy, một số người có ý kiến đề nghị triển khai xây dựng nhà máy điện mặt trời bên ngoài khu vực đầm Trà Ô.

"Mỗi ngày ra đầm đánh bắt kiếm được 200.000 - 300.000 đồng để sinh sống, nuôi con cái. Bây giờ lấy đầm làm nhà máy điện mặt trời sẽ làm lợi cho doanh nghiệp, cho Nhà nước, còn dân chúng tôi có lợi gì, rồi biết lấy gì mà sinh sống", một người dân thôn Mỹ Phú Bắc (xã Mỹ Lợi) hỏi.



Nhiều người dân vẫn bức xúc, không đồng tình việc triển khai dự án trên đầm Trà Ô ANH: HOÀNG TRỌNG

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Quiz



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National security

Tuy Phong, Binh Thuan District



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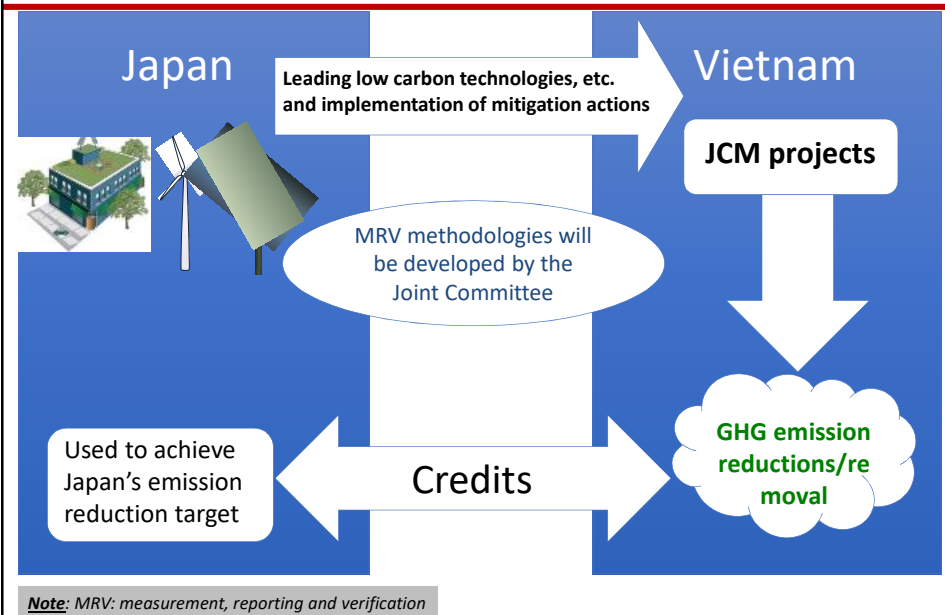
Low-carbon societies development in Vietnam

Energy efficiency in factories, hospital, schools, building etc



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Low-carbon societies development in Vietnam



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Low-carbon societies development in Vietnam

Partner countries	Start from	No. of JC	No. of registered projects	No. of approved methodologies	Pipeline (JCM Financing Programme & Demonstration Projects in FY 2013-2018)
Mongolia	Jan 2013	5	5	3	8
Bangladesh	Mar 2013	4	1	3	5
Ethiopia	May 2013	3		3	2
Kenya	Jun 2013	3		3	3
Maldives	Jun 2013	3	1	1	2
Viet Nam	Jul 2013	6	5	9	21
Lao PDR	Aug 2013	3	1	1	4
Indonesia	Aug 2013	8	13	16	33
Costa Rica	Dec 2013	2		3	2
Palau	Apr 2014	5	3	1	4
Cambodia	Apr 2014	4	1	2	6
Mexico	Jul 2014	2		1	5
Saudi Arabia	May 2015	2		1	1
Chile	May 2015	2		1	1
Myanmar	Sep 2015	2		1	6
Thailand	Nov 2015	4	4	7	26
Philippines	Jan 2017	1			8
Total	17	59	34	56	137

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Low-carbon societies development in Vietnam

Viet Nam - Japan

[Home](#) | [FAQ](#) | [Top](#)

- About The Mechanism
- Joint Committee
 - JC Members
 - JC Decision
- Rules and Guidelines
- Third Party Entity
- Methodologies
 - Proposed methodologies
 - Approved methodologies
 - Methodologies under put on hold
- Project Cycle Search
 - Project Cycle Search
 - Request for registration
 - Registered project
 - Issuance of credits
 - Request for post-registration changes
- Contact us
- Link

About the Mechanism

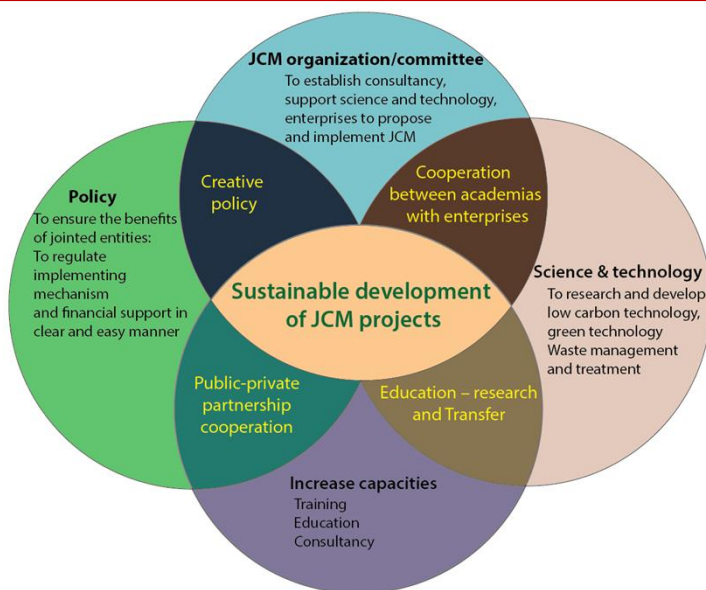
Basic Concept of the Joint Crediting Mechanism (JCM) [more »](#)

News

- 28 May 19 [8th Joint Committee in Hanoi](#)
- 16 Feb 19 [Call for public inputs on JCM proposed methodology "Installation of compressor control system\(s\) for split type air conditioner\(s\)" \(Viet Nam\) \(16 February to 2 March 2019\)](#)
- 05 Feb 19 [Call for public inputs on a proposed JCM project \(Viet Nam\) "Introduction of high-efficient wire stranding machines to the factory of YAZAKI EDS VIETNAM Co., LTD." \(6 February to 6 March 2019\)](#)
- 24 Jan 19 [Call for public inputs on a proposed JCM project \(Viet Nam\) "Introduction of Amorphous High Efficiency Transformers in Northern Central and Southern Power Grids" \(24 January to 22 February 2019\)](#)
- 04 Dec 18 [Call for public inputs on a proposed JCM project \(Viet Nam\) "Introduction of High Efficiency Water Pumps in Da Nang City" \(4 December 2018 to 2 January 2019\)](#)
- 21 Nov 18 [Call for public inputs on a proposed JCM project \(Viet Nam\) "Installation of Energy Saving Equipment in Lens Factory" \(21 November to 20 December 2018\)](#)
- 20 Sep 18 [Call for public inputs on a proposed JCM project \(Viet Nam\) "Installation of Container Formation Facility at Lead Acid Battery Factory of Hitachi Chemical Energy Technology \(Vietnam\) Co., Ltd." \(20 September to 19 October 2018\)](#)
- 29 Aug 18 [Decision by the JC](#)
- 15 Aug 18 [7th Joint Committee in Hanoi](#)
- 14 Aug 18 [Call for public inputs on JCM proposed methodologies "Introduction of tunnel and/or shuttle kiln with waste heat recovery system", "Energy Saving by Introduction of High Efficiency Inverter Type Centrifugal Chiller", "Energy Saving by Introduction of Heat Recovery Electric Heat Pump", "Energy saving by introduction of high-efficiency double suction volute pumps in water supply system" and "Introduction of energy efficient wire stranding machines to automotive wire production factory." \(Viet Nam\) \(14 to 28 August 2018\)](#)
- 16 Dec 17 [Call for public inputs on a proposed JCM project \(Viet Nam\) "Introduction of Energy-Efficient Air Conditioners in RICOH IMAGING PRODUCTS \(Vietnam\) CO., LTD." \(16 December 2017 to 14 January 2018\)](#)
- 08 Dec 17 [Call for public inputs on proposed JCM projects \(Viet Nam\) "Introduction of Solar PV System at shopping mall in Ho Chi Minh" and "Introduction of Amorphous High Efficiency Transformers in Southern and Central Power Grids" \(8 December 2017 to 6 January 2018\)](#)
- 18 Nov 17 [Call for public inputs on a proposed JCM project \(Viet Nam\) "Energy saving and work efficiency improvement by introducing a new chip-on-board LED system in Vietnam" \(18 November to 17 December 2017\)](#)
- 10 Oct 17 [8th Joint Committee in Hanoi](#)
- 13 Jun 17 [Call for public inputs on a JCM proposed methodology \(Viet Nam\) "Installation of Container Formation Facility at Acid Lead Battery Factory" \(13 June to 27 June 2017\)](#)

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Low-carbon societies development in Vietnam



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Low-carbon societies development in Vietnam

- **To promote cooperation between academia with enterprises**
 - Research and development:
 - low carbon technology, green technology; high efficiency of energy production, use and management;
 - prioritization of JCM projects;
 - measures for JCM implementation.
 - Promotion mechanism for transferring the LC technology and energy efficiency use/management technology
- **To promote education-research and transfer**
 - Development of capacities in low carbon society development, Ecosystem, Environment, Economy NEXUS and JCM implementation and consultancy and knowledge transfer based on research, learning by doing, project and case study
 - Better use of existing and trained human resource: how to be used such to be trained and educated!

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Low-carbon societies development in Vietnam

- **To promote public-private partnership cooperation**
 - Open information on policy and institution and methodologies of JCM development to enterprises
 - Close connection between Government-Academia- Business (TECHNOPOLIS):
 - Japanese businesses/ industries/academia/governmental departments;
 - Vietnam policy maker/manager, private sector and businesses, academia and education institutions
 - Policies and mechanism promoting low carbon society and JCM Technopolis

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Homework 1

- Read the paper and we will discuss on the topic of adaptation to climate change and sea level rise in Mekong delta, tomorrow?

nature
climate change

ARTICLES

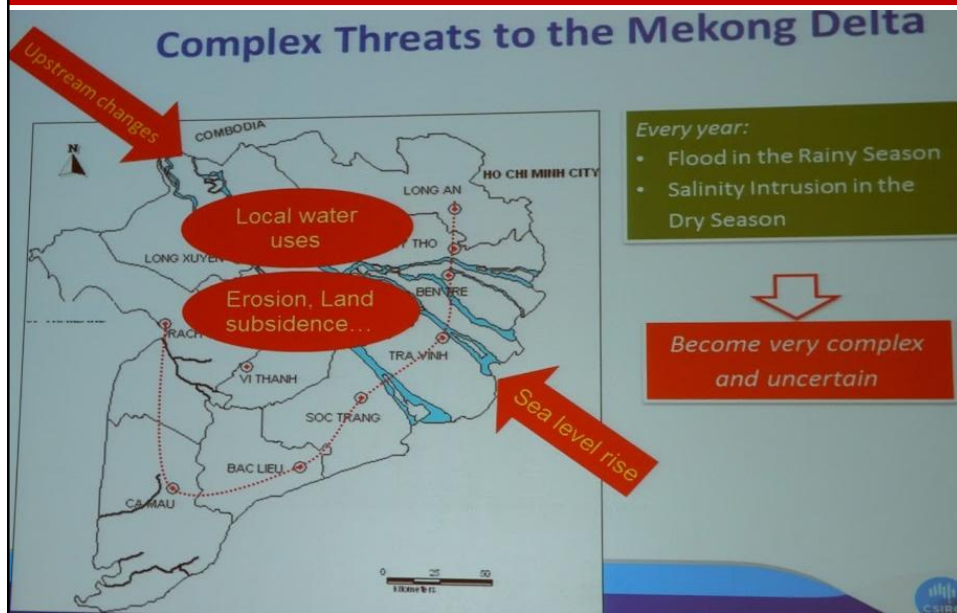
PUBLISHED ONLINE: 12 JANUARY 2015 | DOI: 10.1038/NCLIMATE2469

Responding to rising sea levels in the Mekong Delta

A. Smajl^{1,2*}, T. Q. Toan³, D. K. Nhan⁴, J. Ward^{1,2}, N. H. Trung⁵, L. Q. Tri⁵, V. P. D. Tri⁵ and P. T. Vu⁵

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Homework 1



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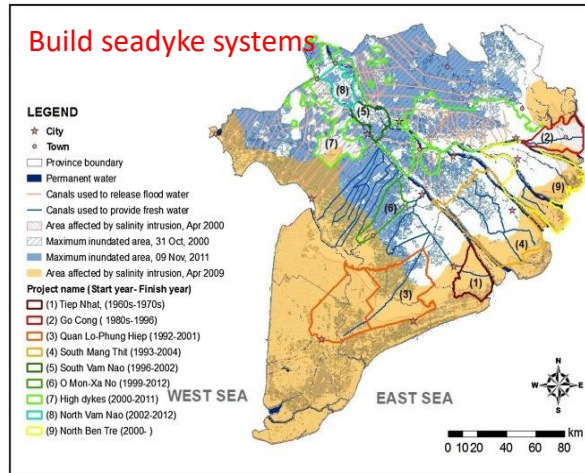
Finding problems

- What do the action plans of Dutch-Vietnamese MKD plan, JICA, Vietnam Gov. support?
- What is negative impacts sea dyke on the evolution of the MKD?
- What are the soft measures?
- What we should do to keep the food security target?
- What are the recommendations for all-driver scenario?
- What are the recommendations for hard adaptation scenario
- What do you think the best solutions for MKD adapts to climate change?
- What is different between stakeholder views and households in term of outmigration?
- What methods are used to measure household-level vulnerability?

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Finding problems

- What do the action plans of Dutch-Vietnamese MD plan, JICA, Vietnam Gov. support?



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Finding problems

- Effects of dyke systems on the salinity levels

Table 1 | Projected change in area at different levels of salinity due to construction of sea-dykes.

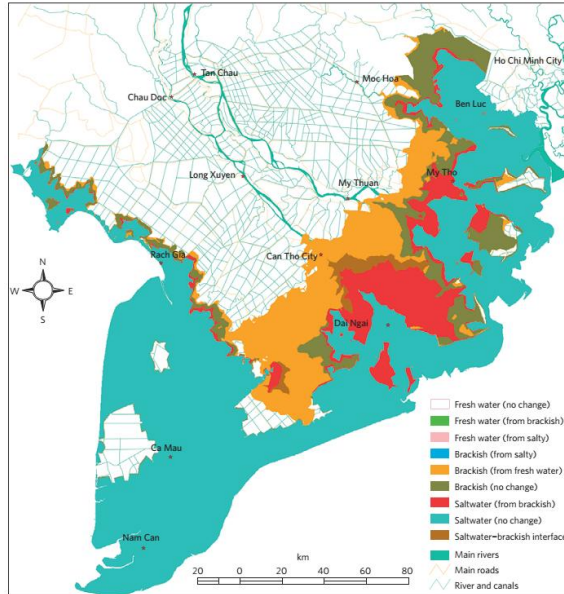
	Fresh	<2 g l ⁻¹	2-4 g l ⁻¹	4-10 g l ⁻¹	10-20 g l ⁻¹	>20 g l ⁻¹
Cai Lon and Cai Be	155	-74	6	36	63	-186
Ham Luong and Co Chien	174	100	-88	-115	-71	0
Both	329	26	-82	-79	-8	-186

Columns 2-7 quantify in 1,000 hectares the change in area under freshwater conditions, with salinity levels of 0-2 g l⁻¹, 2-4 g l⁻¹, and so on. The sum across the salinity gradient should equal zero, as the total area does not change.

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Finding problems

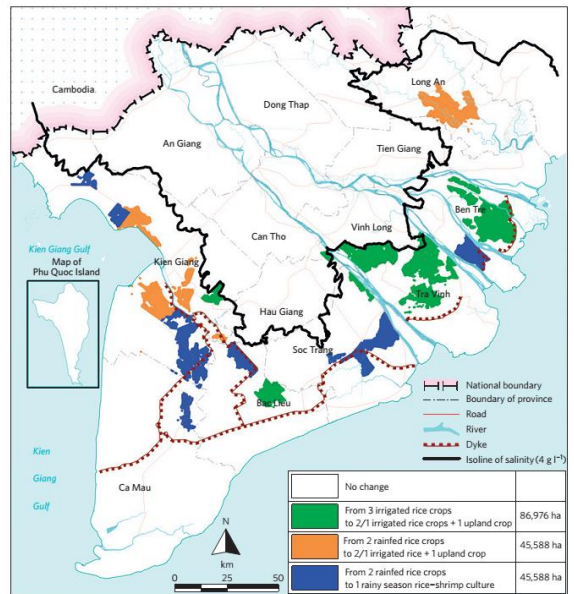
Salinity intrusion (indicated by an increasing red colouration) for the all-driver scenario, including 30 cm of sea-level rise, development of all planned upstream reservoirs and irrigation schemes, and an increase in dry years



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Finding problems

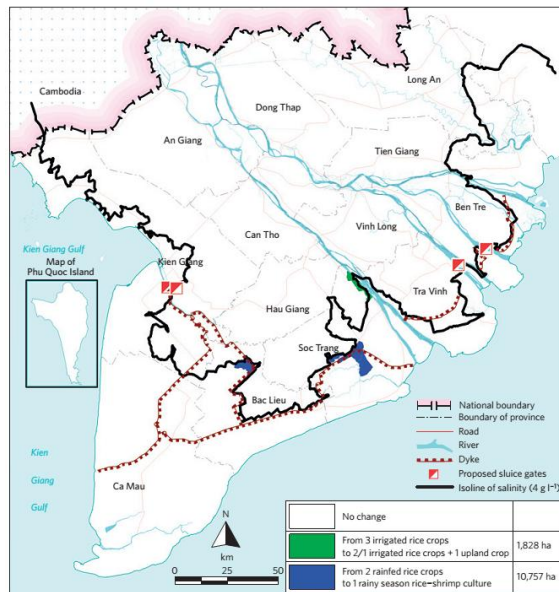
Recommended land-use change for the all-driver scenario, which includes 30 cm of sea-level rise, development of all proposed upstream reservoirs and irrigation streams, and an increasing number of dry years



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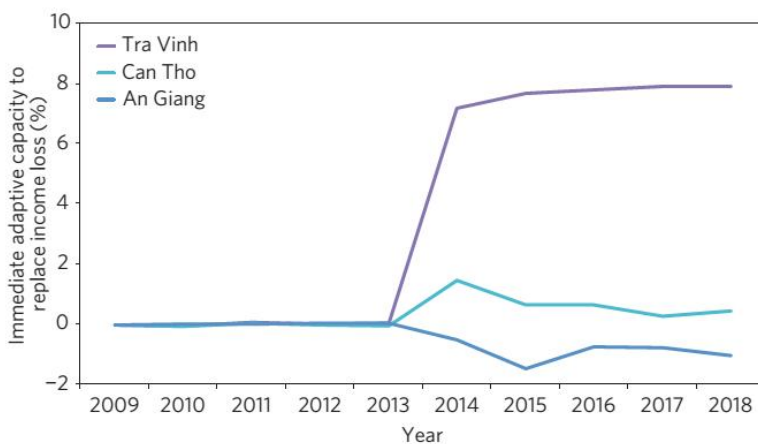
Finding problems

Recommended land-use change for the hard adaptation scenario, which includes the upgrade of existing sea-dykes and the construction of major estuary sluice gates in Cai Lon, Cai Be, Ham Luong and Co Chien



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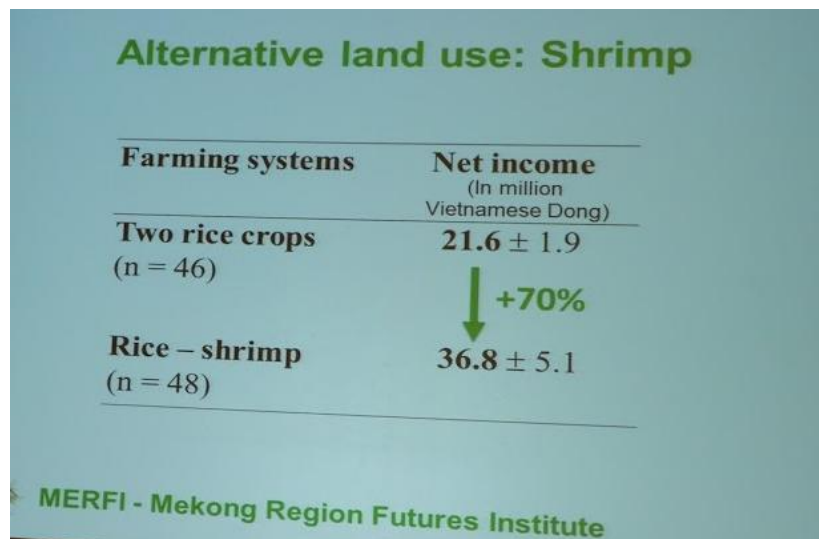
Finding problems



Ability of households to replace income losses in Tra Vinh, Can Tho and An Giang based on an integrated simulation model

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Finding problems



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Homework 2

- **Can you describe an examples of CSA in Vietnam?
Please demonstrate the following:**
 - Contribution of this CSA to food security
 - Opportunities and challenges of this CSA

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Homework 3

- Can you propose a indicator set to evaluate the climate change security in Vietnam?

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Homework 3



- Climate change security analysis allows decision makers to anticipate and respond to future crises.

Identifying appropriate indicators to measure security levels are very important.



It plays an important role in predicting the onset of danger situation and can facilitate an appropriate response.

In order to intervene and reduce threats, existing risks and increase the security level.

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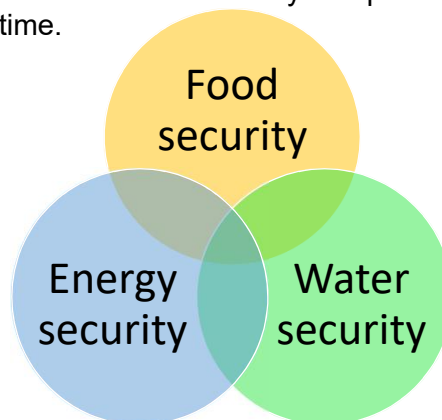
Homework 3

- A security indicator helps to understand the probability of danger.
 - A good indicator should alert decision-makers to a problem before it gets too difficult to fix.
- a way of characterizing the dimensions of climate change security;
- a pointer to how levels and causes of climate change security are changing.

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Homework 3

- A variety of indicators may be used to assess the various dimensions of climate change security.
 - Different pieces of data (or indicators) help us to understand different causes of climate insecurity and predict how these change over time.



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Homework 3

- indicator set to evaluate the climate change security

Dimensions	Indicators	Variables	Data sources	Unit	Calculating methods
Food Security					
Water security					
Energy security					

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Homework 3

- indicator set to evaluate the climate change security

Dimensions	Indicators	Data sources	Calculating methods
Food Security		The suite of food security indicators	
		FOOD SECURITY INDICATORS	
		DIMENSION	
Water security		Average dietary energy supply adequacy Average value of food production Share of dietary energy supply derived from cereals, roots and tubers Average protein supply Average supply of protein of animal origin	AVAILABILITY
		Percentage of paved roads over total roads Road density Rail lines density	PHYSICAL ACCESS
Energy security		Domestic food price index	ECONOMIC ACCESS
		Access to improved water sources Access to improved sanitation facilities	UTILIZATION
		Cereal import dependency ratio Percentage of arable land equipped for irrigation Value of food imports over total merchandise exports	VULNERABILITY
		Political stability and absence of violence/terrorism Domestic food price volatility Per capita food production variability Per capita food supply variability	SHOCKS

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Module 6

Human resource development for climate change adaptation

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Human resource for CC response

THE NATIONAL LEVEL

1. Establishing National Committee for Climate Change
2. Establishing National Steering Committee on National Target Programme to respond to climate change
3. Coordinating the implementation of other programmes

THE PROVINCIAL LEVEL

1. Steering Committee in responding to climate change
2. Standing Committee in responding to climate change

THE UNIVERSITIES/INSTITUTIONS

1. Programs/Subjects related to climate change



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Human resource for CC response

• Policies to strengthen human resources

- The implementation of human resource training and development for climate change will be difficult, but it is an important political task.
- It is necessary to create opportunities for scientists, especially young scientists, to engage in climate change research so that they can get new knowledge in climate change research and gain experience in working with leading climate change experts.
- Accurate research results on climate change will be an important basis for updating and improving the database on knowledge on climate change, and textbook materials for training and human resources development.

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Education for CC response

Education and awareness

- Both success and failure



- Sharing experiments and lessons learned
- Sharing further ideas

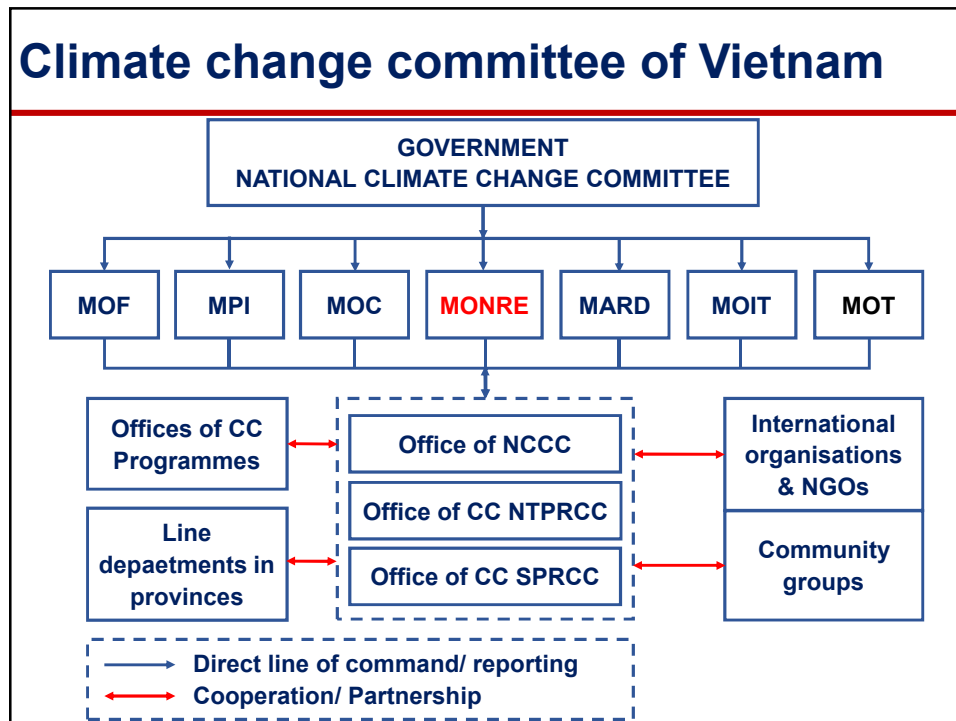


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Module 7

Development and improvement of climate change adaptation cooperation

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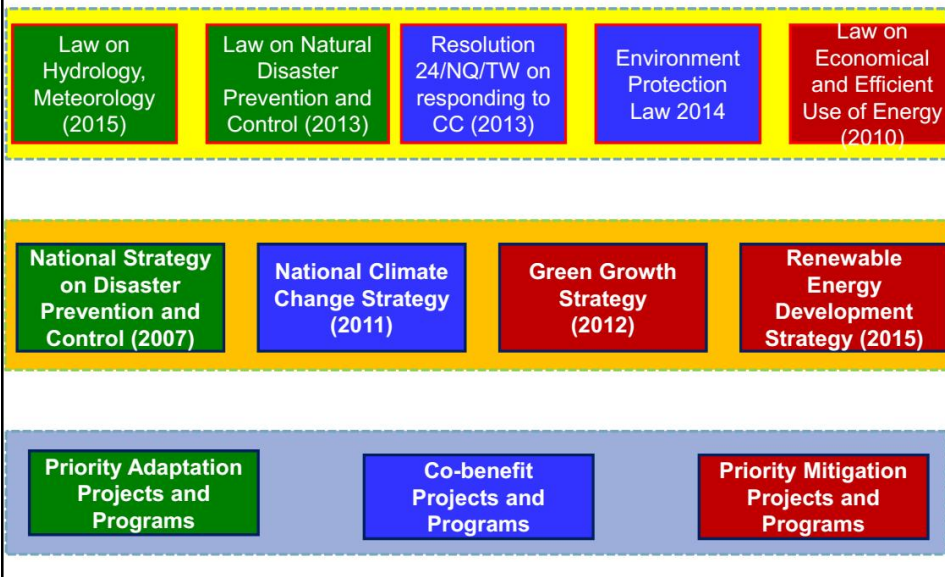
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Vietnam Policies and Legal Documents on Climate Change

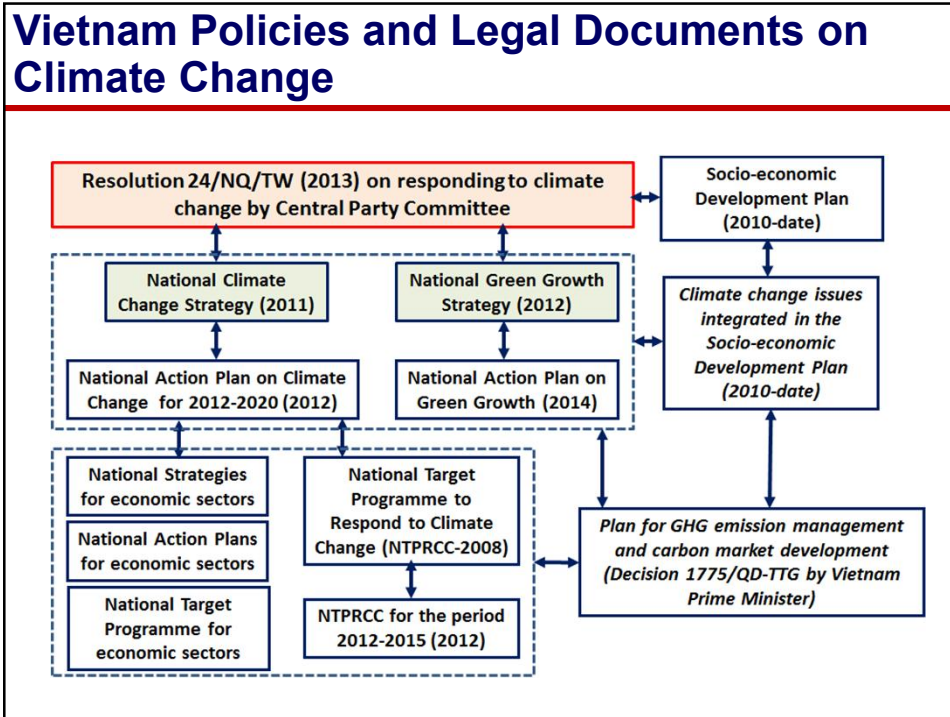
1. The PM's Directive on organizing the implementation of the Kyoto Protocol under UNFCCC11;
2. The plan for organizing the implementation of the Kyoto Protocol under UNFCCC for the period 2007 – 2010;
3. The National Target Program for Responses to Climate Change (NTP) 2008;
4. National strategy on climate change 2011;
5. National target program on climate change for the period 2012 – 2015;
6. National Action Plan on climate change for the period 2012 – 2020;
7. National Green Growth Strategy 2012;
8. Project for management of GHG emission and carbon credit trading activities to the world market 2012;

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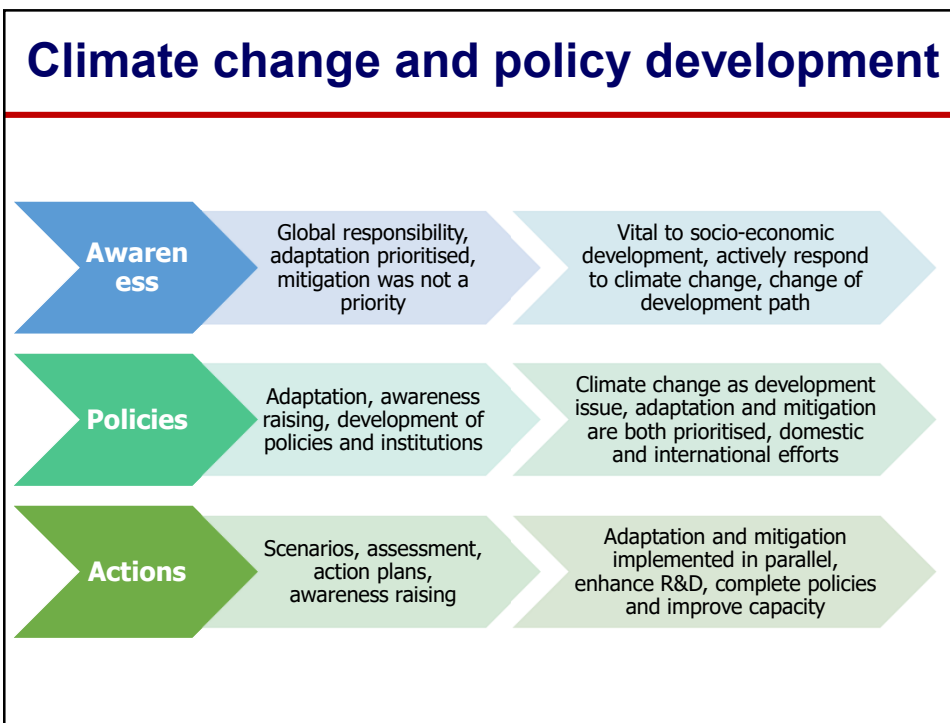
Vietnam Policies and Legal Documents on Climate Change



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National Climate Change Strategy

Strategic tasks

A. Adaptation

- 1: Actively respond to natural disasters and monitor climate change
- 2: Ensuring food security and water security
- 3: Respond to rising sea levels for vulnerable areas

B. Mitigation + Adaptation

- 4: Protection and sustainable development of forests and biodiversity conservation for effective response to climate change

C. Mitigation

- 5: Reducing emissions and enhance greenhouse gases sequestration to contribute to the protection of the Earth's climate system

D. Cross-cutting

- 6: Strengthen the Government's leading role in responding to climate change
- 7: Develop measures for communities to effectively respond to climate change
- 8: R&D in science and technology to serve responding to climate change
- 9: Strengthen international cooperation and integration in global community on climate change issues
- 10: Diversification of financial resources and investment for responding to climate change

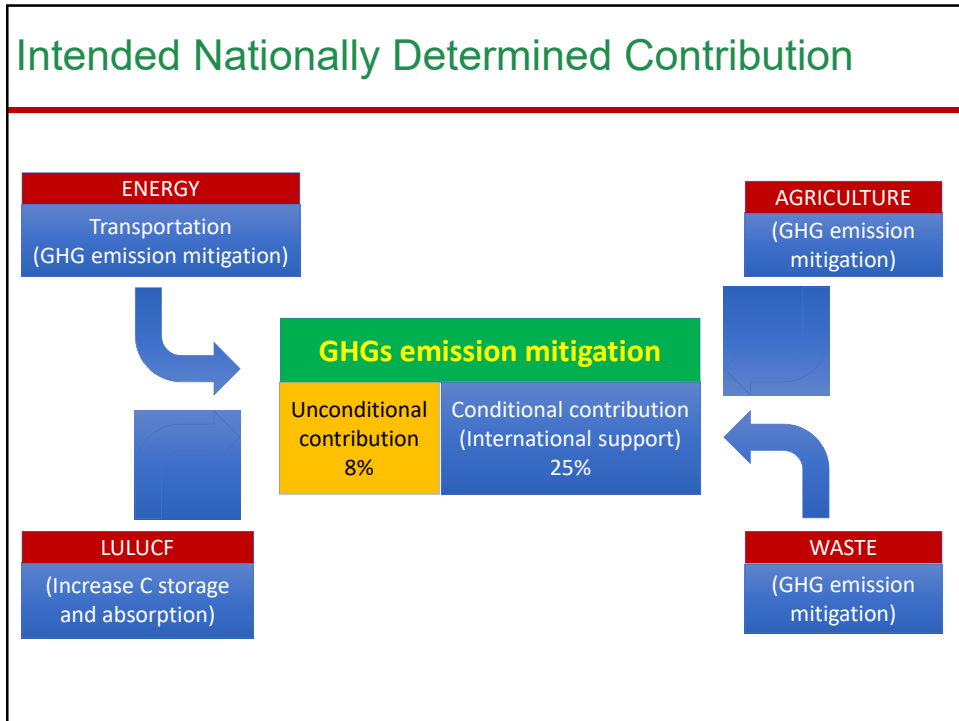
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National Climate Change Strategy

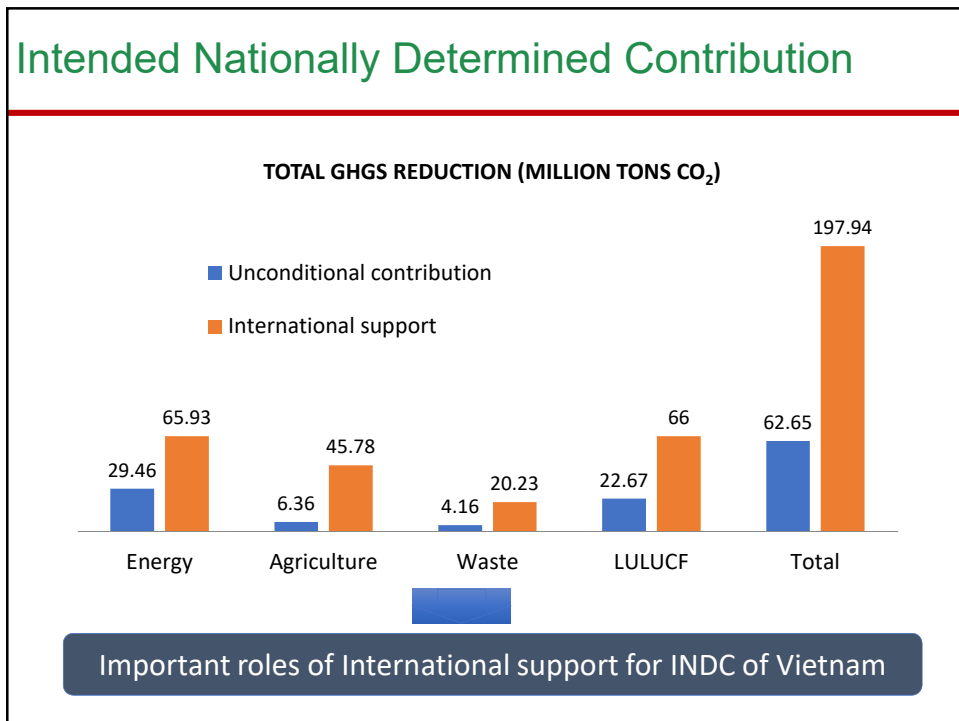
IMPLEMENTATION PHASES

- **From now to 2012:**
 - Urgent and unpostponable adaptation activities;
 - Capacity building, strengthening science and technology R&D
 - Review, adjust and supplement mechanisms and policies in accordance with domestic and international conditions.
- **2013 - 2025:**
 - To become an industrialized country, strengthen adaptation and mitigation activities in association to socio-economic development of the country.
- **2026 - 2050:**
 - Reduce GHG emissions become principles of socio-economic development activities.
 - Strategy will be reviewed and adjusted, supplemented with new development thinking in order to develop and strengthen low-carbon economy with high resilience to the impacts of climate change.

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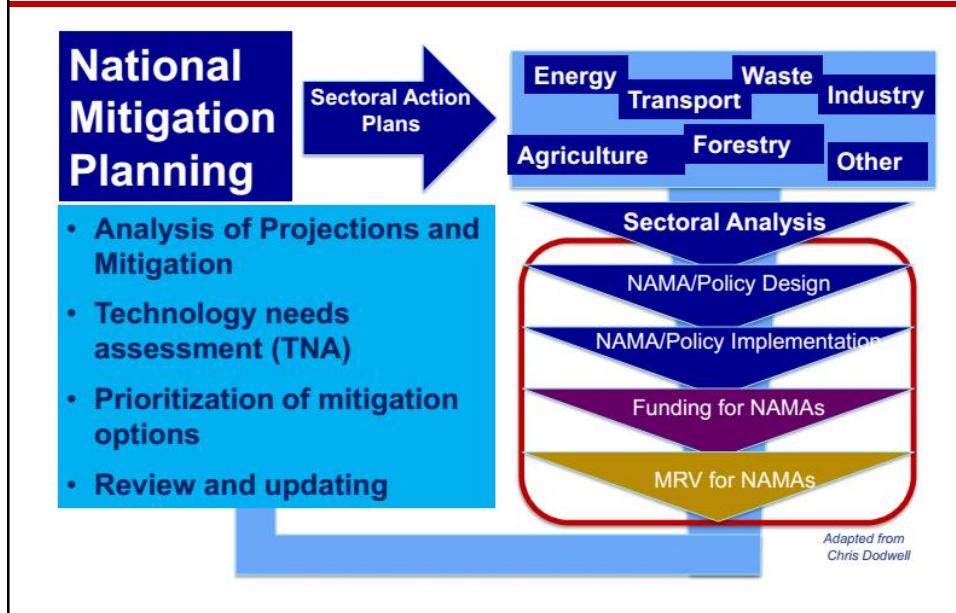


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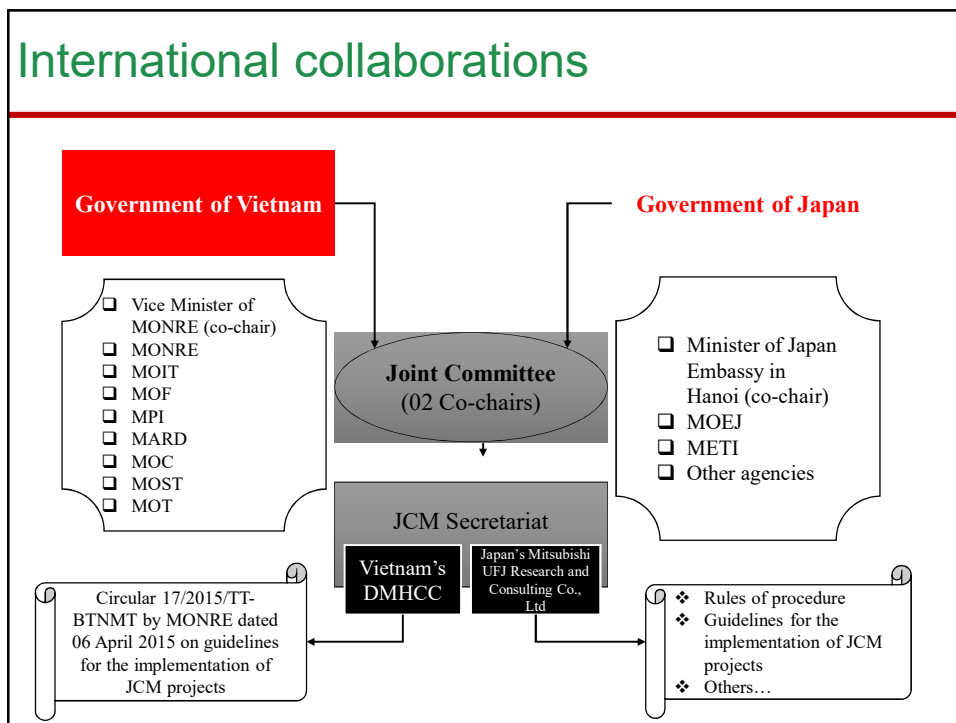
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Implementation of the Paris Agreement (PA)



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International collaborations



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Climate change response policy in Vietnam

How do we identify relevant international and national policies and governance on CC?

What are impacts of CC policies and governance on sustainable development at the international and national levels?

How to evaluate the impacts of CC policies?

How to collaborate in proposing solutions to promote the national and international policies on CC ?

Role of academia, education and research framework on Policy and Governance for CC response.

Key issues:

- Current status of policies & governance on CC.
- Best practice, experience.
- Low-Carbon Climate Resilient Development.
- Impact of CC policy and gov
- Role of Science in CC policy and gov.

Panel 4: Policy and Governance of CC response & sustainability

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Interview questions

- You can choose one of below questions
1. Can you demonstrate the climate change is threatening Vietnam security? Give an example.
 2. What are the main drivers to threaten the security of Mekong Delta. What should we do for increasing security of Mekong Delta from climate change and human activities?
 3. Can you propose the adaptation solutions for increasing food security in the context of climate change in Vietnam? Particularly, Mekong Delta are the most vulnerable area to climate change, but there is an important food producing for Vietnam?

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