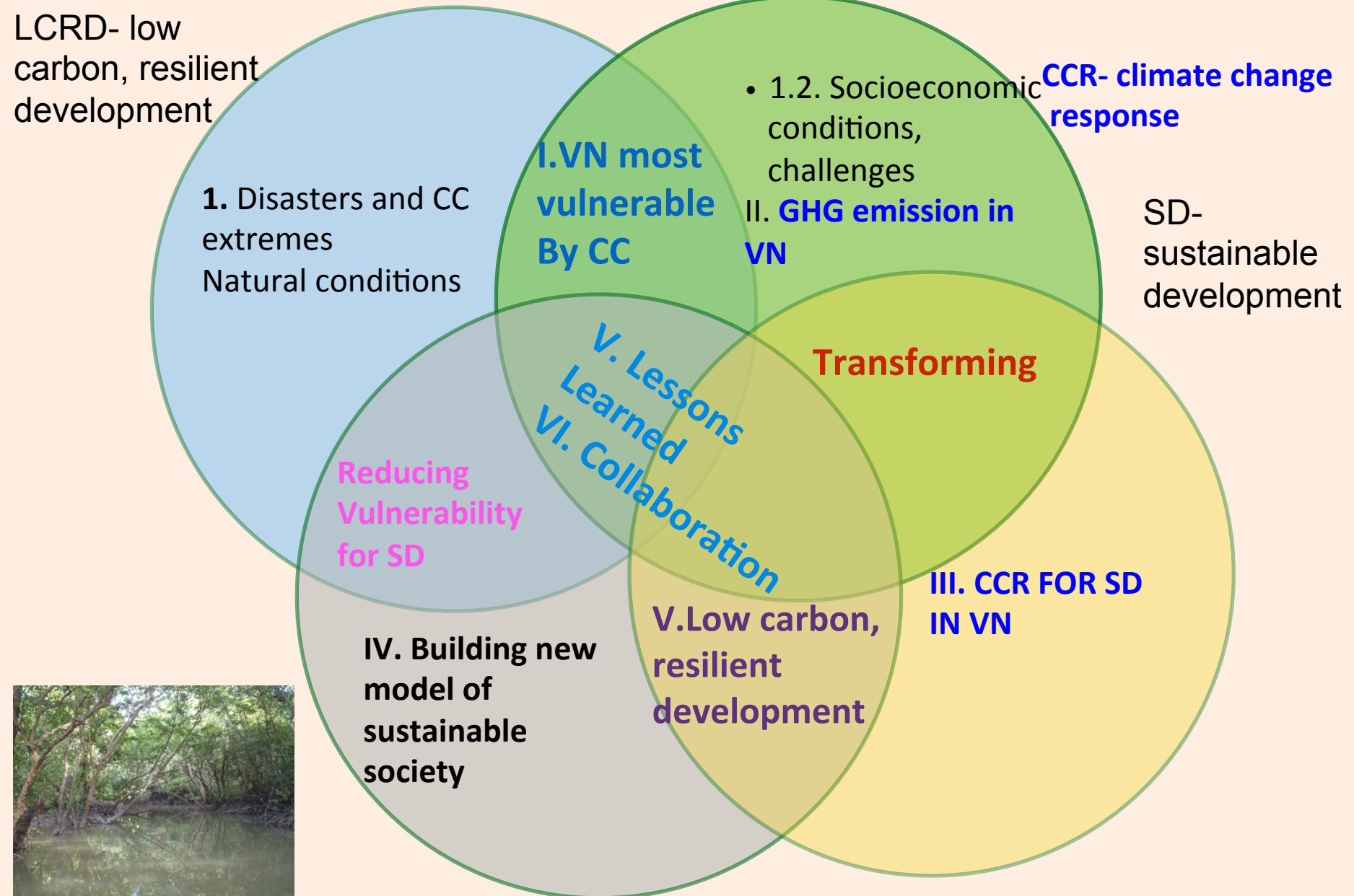


Building sustainable Society for climate change mitigation and sustainable development in Vietnam

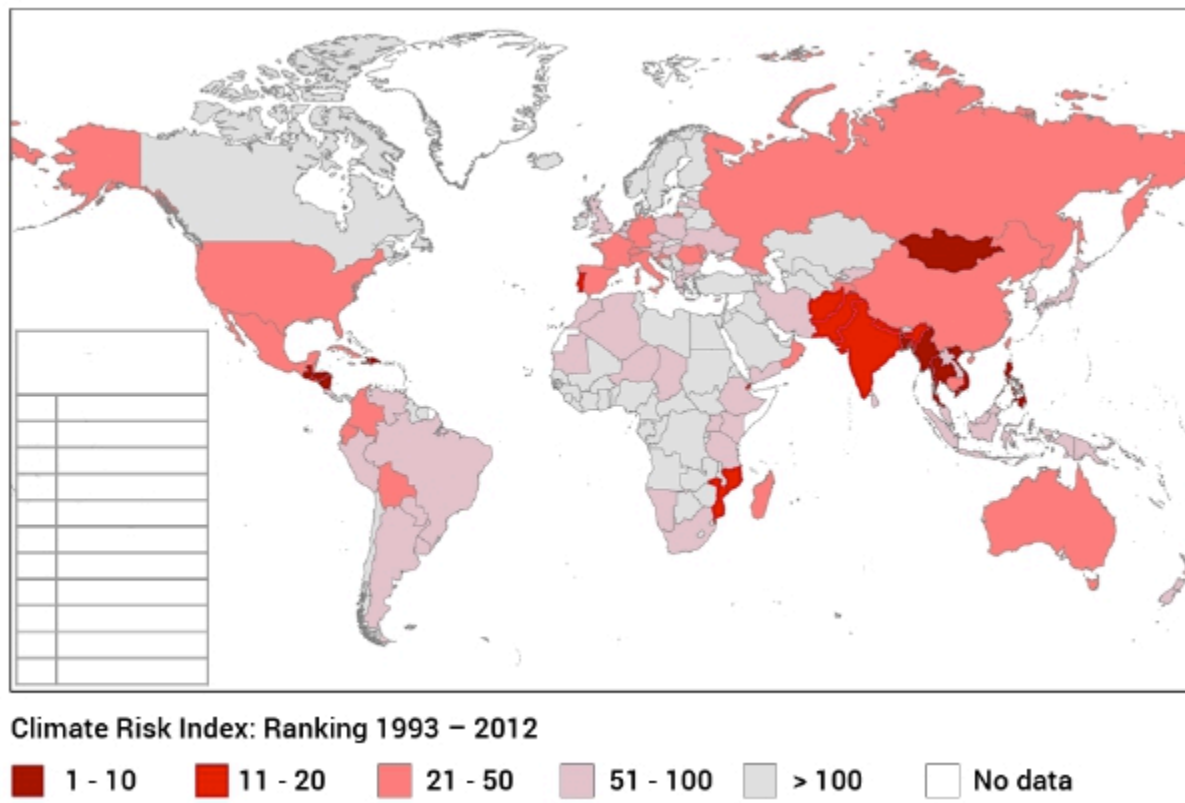
Mai Trong Nhuan, Nguyen tai Tue, Tran Dang Quy, Nguyen Thi Thu Ha, Nguyen Thi Hoang Ha, Luu Duc Dung

Vietnam National University, Hanoi

MAIN CONTENTS

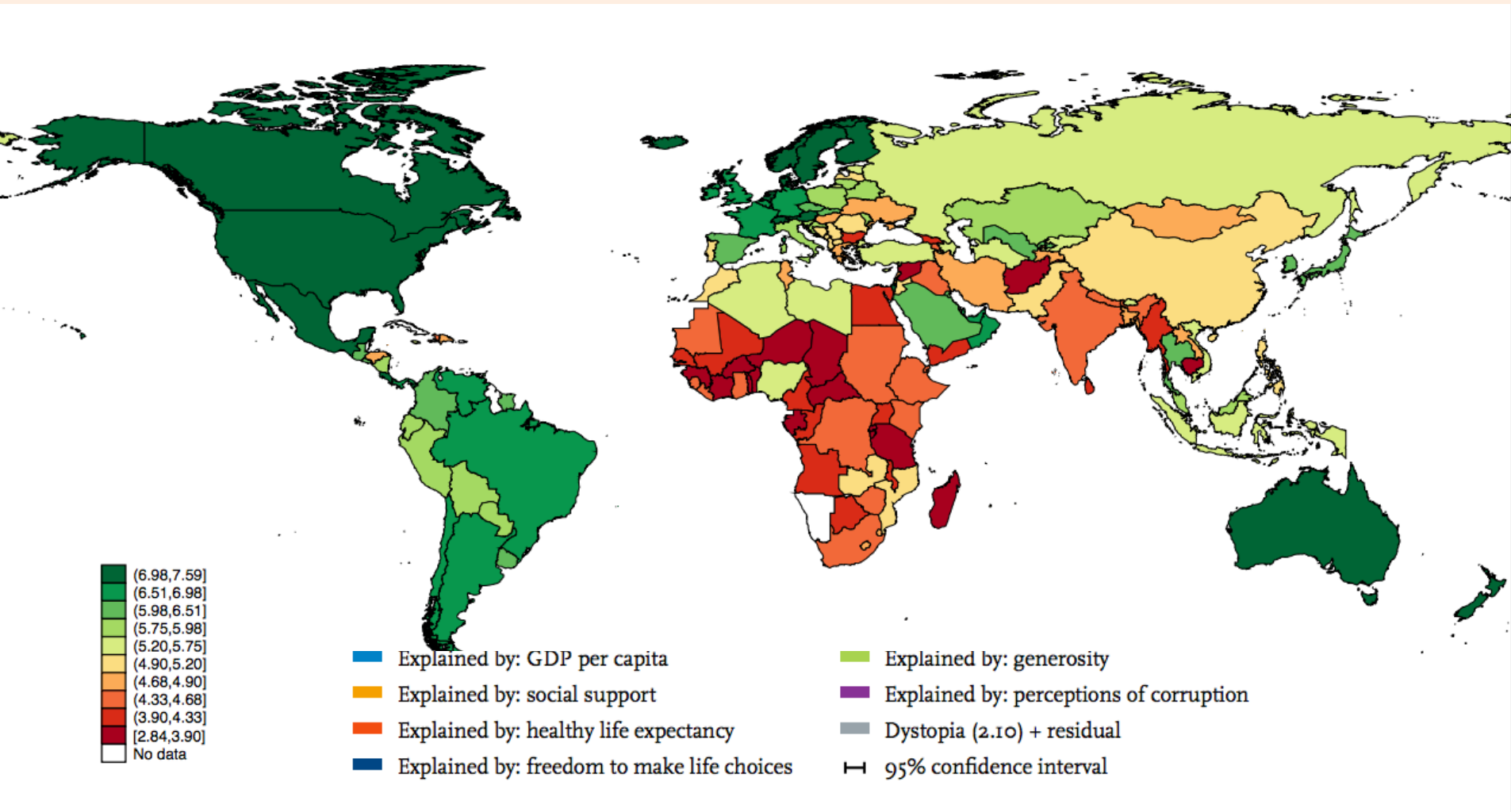


1. Vietnam is one of the most CC vulnerable countries

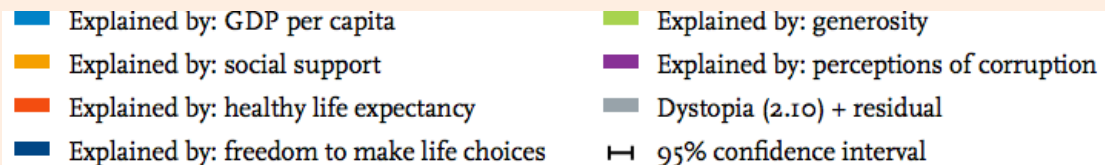
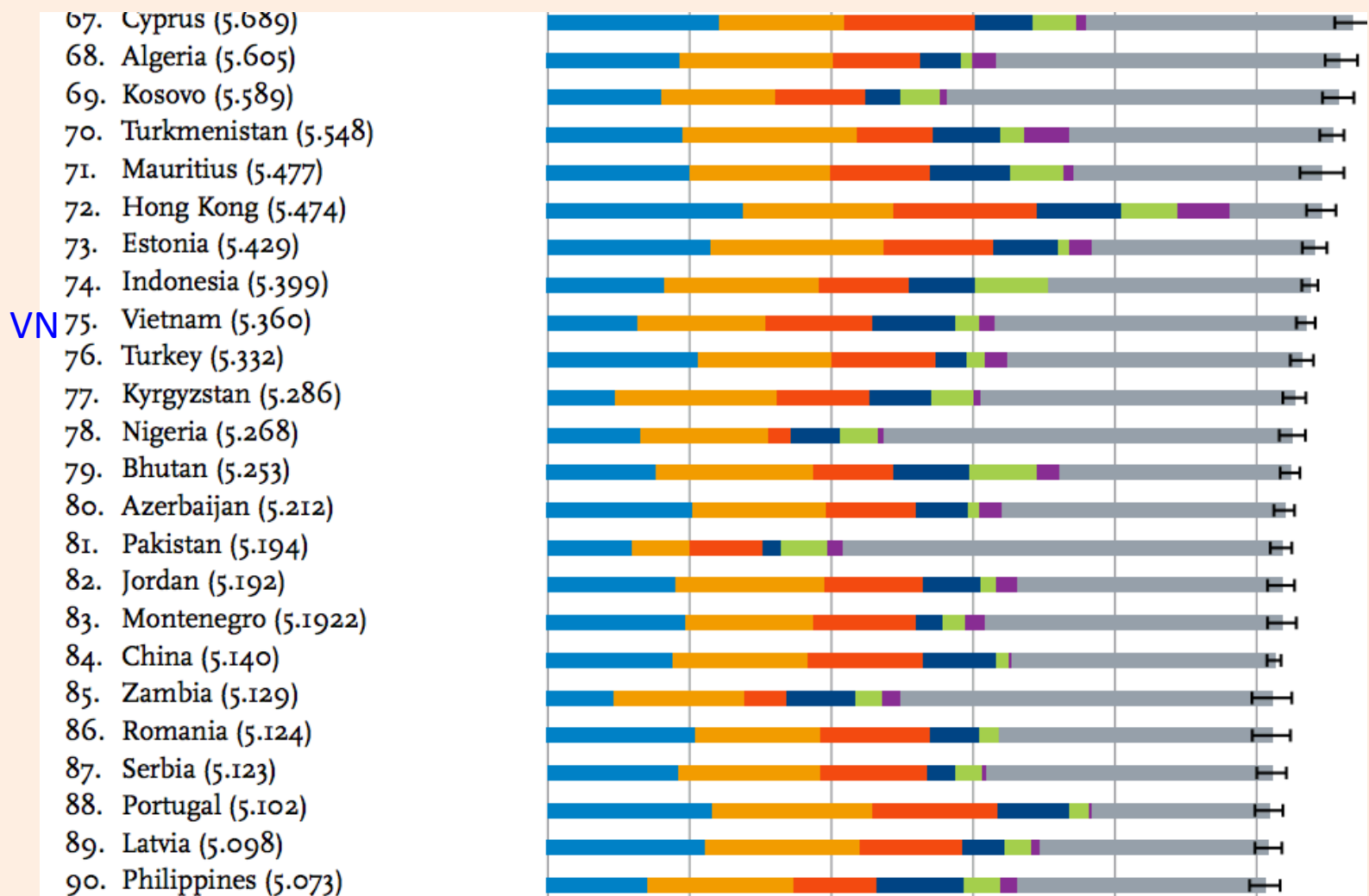


Climate risk index: VN ranked in top 10 (1993-2012)

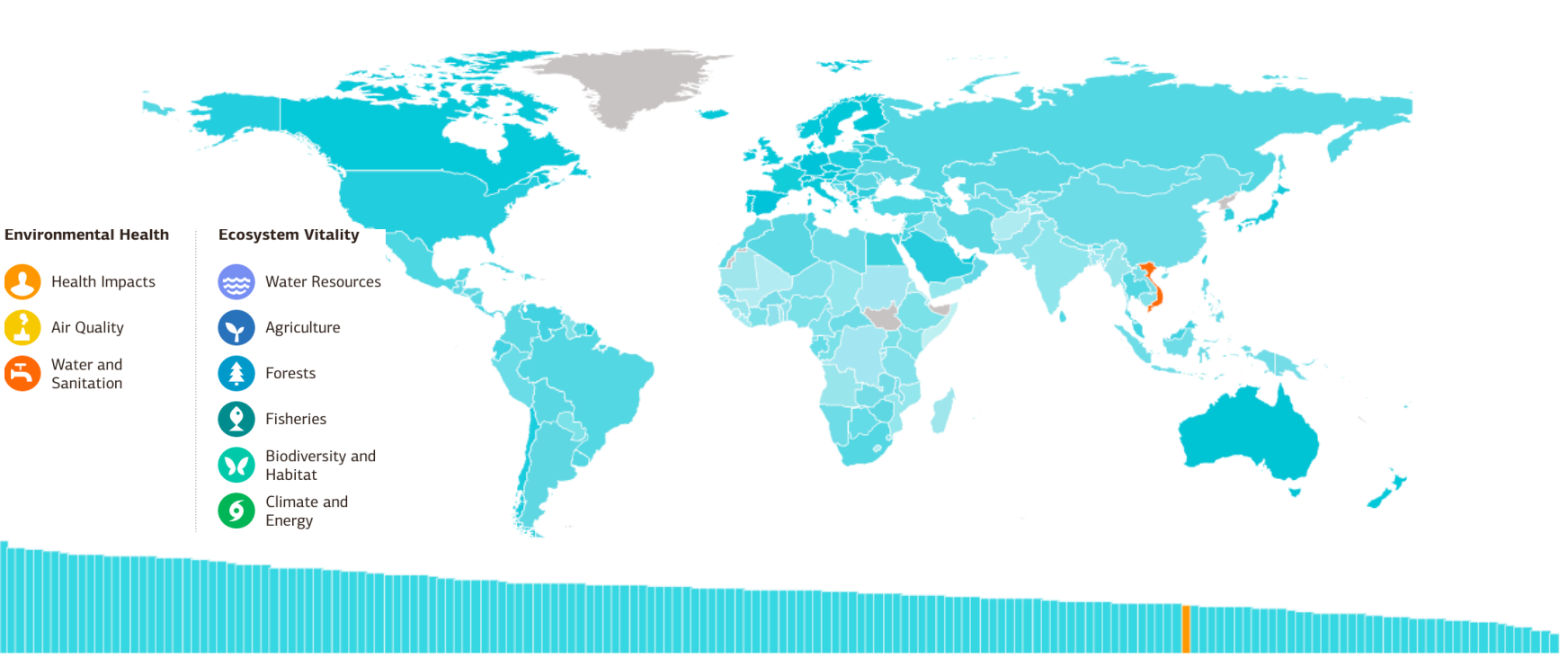
Happiness index : Vietnam ranked at 75



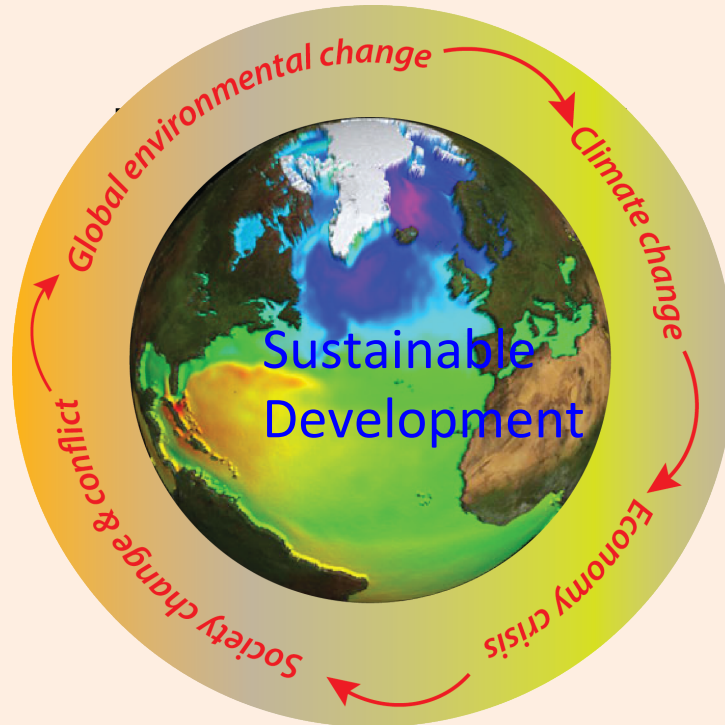
Happiness index : Vietnam ranked at 75



Environment performance index : Vietnam ranked at 136



1.1. Natural and socioeconomic conditions of Vietnam are very sensitive to CC, extremes

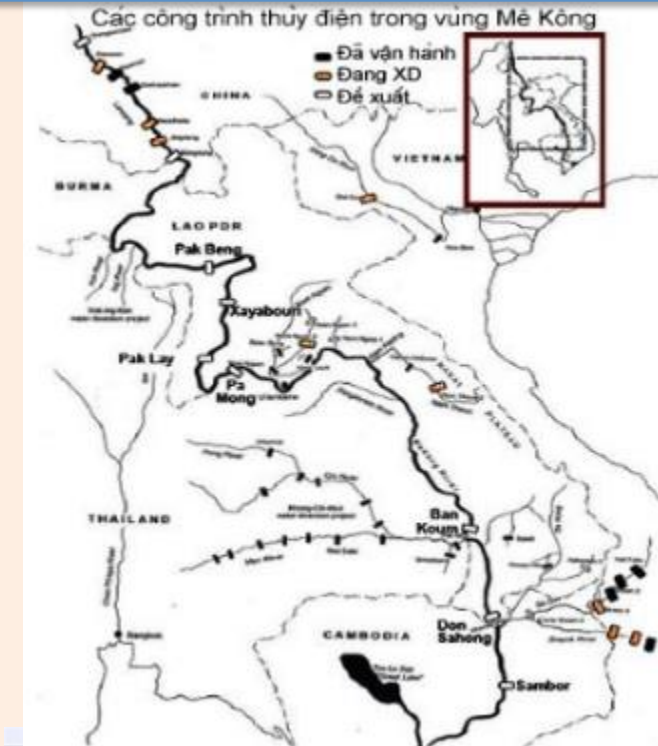


I. Natural and socioeconomic conditions of Vietnam are very sensitive to CC, extremes

1.1. Natural conditions

Natural conditions are **sensitive to CC negative impacts**:

- + 2/3 territory is mountainous; strongly dissected,
- + High differentiation of natural conditions
- + Abundant coastal lowlands, flooded areas arid regions,
- + Long Coastline, over 3260 km; every 10km one river mouth;
- + Nearly 65% of Vietnam's surface water resource from overseas
- + Water shortage: Has used approximately 40% of water source, approximately ecological safety threshold recommended by the FAO



I. Natural and socioeconomic conditions of Vietnam are very sensitive to CC, extremes

1.2. Socio-economic conditions

Minority and poor people habited in the areas very sensitive to CC and disasters

Main production sectors: agriculture, fisheries and forestry – much dependent and vulnerable to the impact of CC;

Level development of science and technology, technical and socio-economic infrastructures - lower than requirements to respond to CC

High population density; Low income

Fast urbanization

1.1. Natural and socioeconomic conditions of Vietnam are very sensitive to CC, extremes: Unsustainable human activities

Urbanization



Industrialization



Over exploration of natural resources



Hazards



Climate change



Ecosystem degradation



Environmental Pollution



1.2. In Vietnam there are all disasters and extremes related to climate change

Strong wind



Storm



Heavy rain



Cyclone



Debris flows



Flood (river, coastal)



Drought, salinization

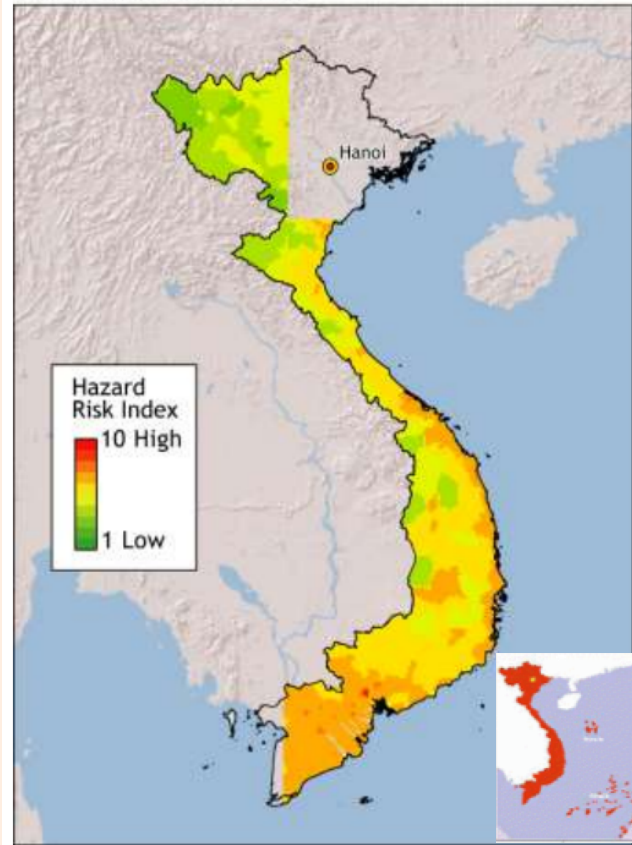


Fire



1.2. In Vietnam there are all disasters and extremes related to climate change

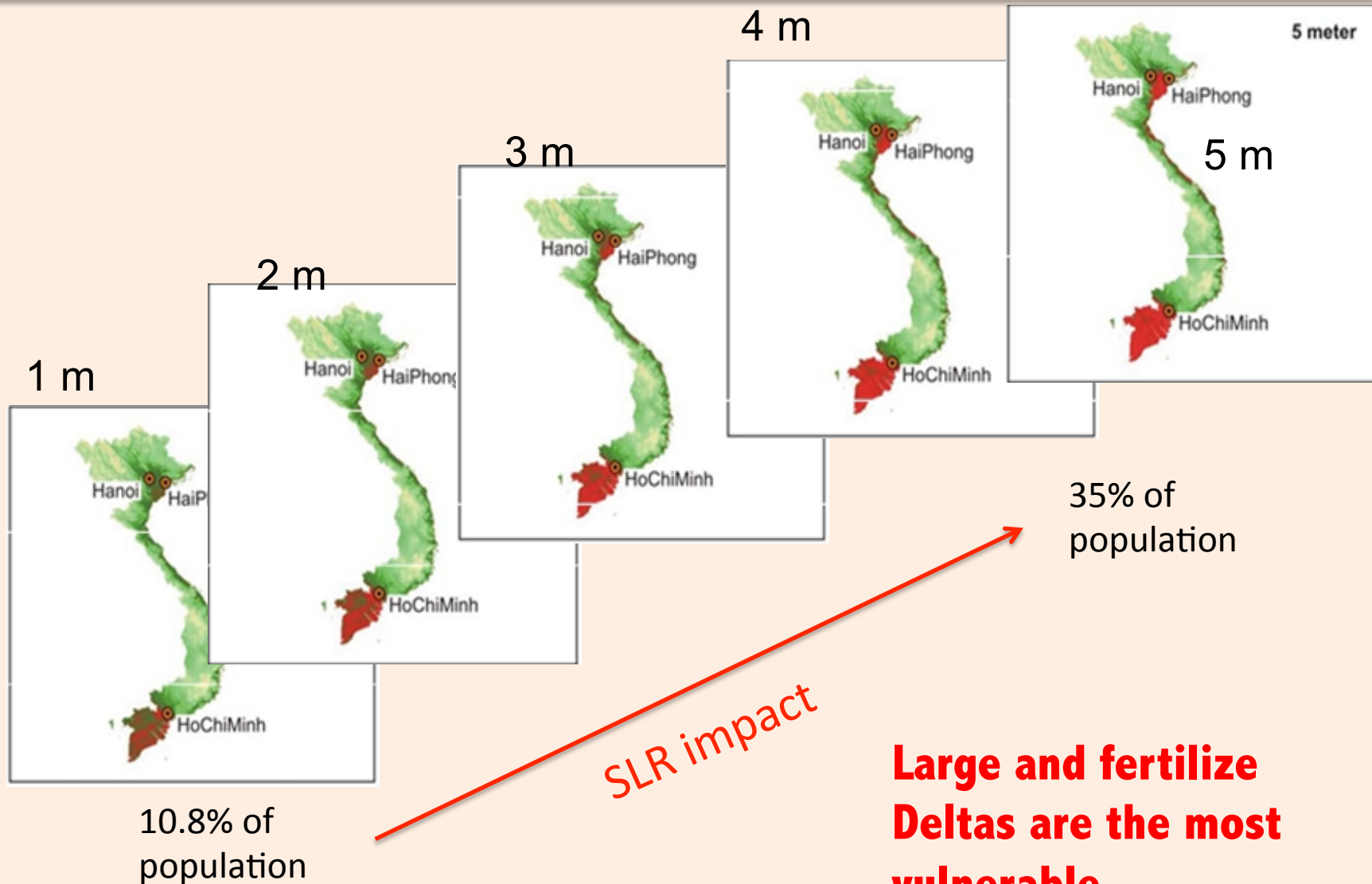
Risk of Drought Mortality



Drought

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

1.2. In Vietnam there are all disasters and extremes related to climate change



**Large and fertile
Deltas are the most
vulnerable**

Sea level rise

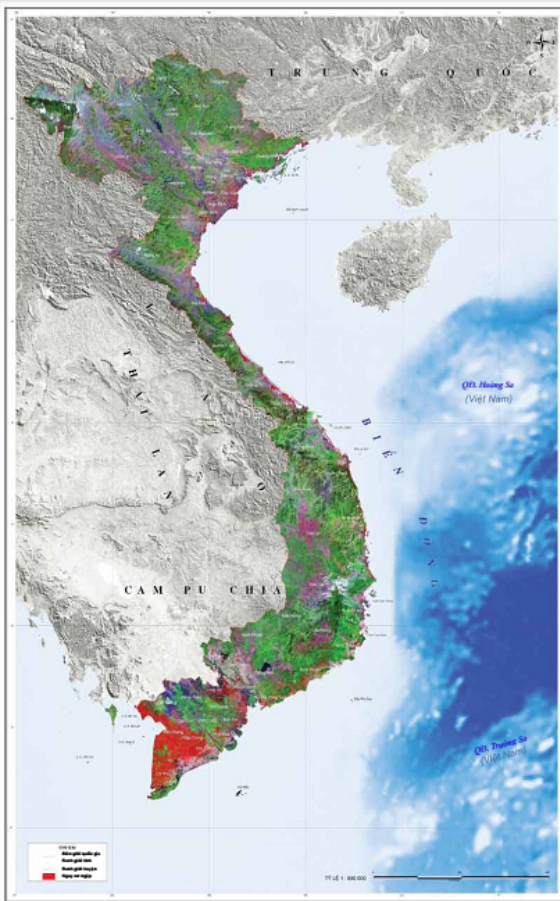
1.2. In Vietnam there are all disasters and extremes related to climate change

Flood

- ❖ **Red River delta:** Reduction of the annual flow, big floods occurred frequently in the upstream.
- ❖ **Mekong River delta:** witnessed many floods, especially in 2000, 2001, 2011, with the water level of over 4.5m.
- ❖ **The Central Vietnam:** Occurred very fast and dangerous



1.2. In Vietnam there are all disasters and extremes related to climate change



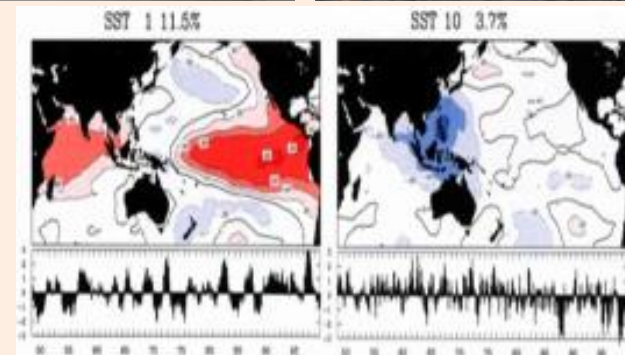
Floods

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

1.2. In Vietnam there are all disasters and extremes related to climate change

Other extremes

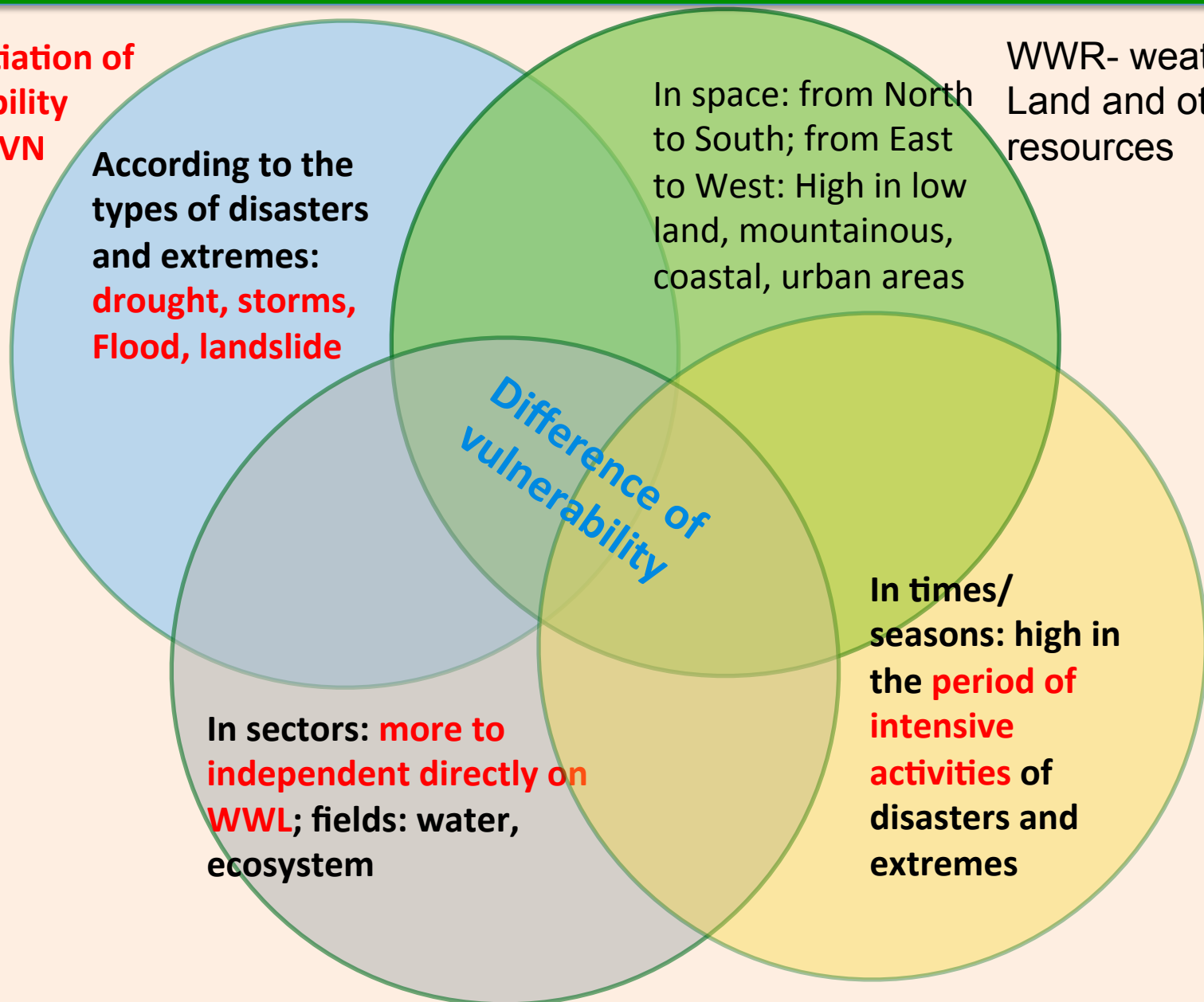
- Cold days in the North decrease;
- More extreme cold days;
- Unseasonable rain and abnormal heavy rainfall more frequent;
- El Nino/ La Nina have impacted stronger.



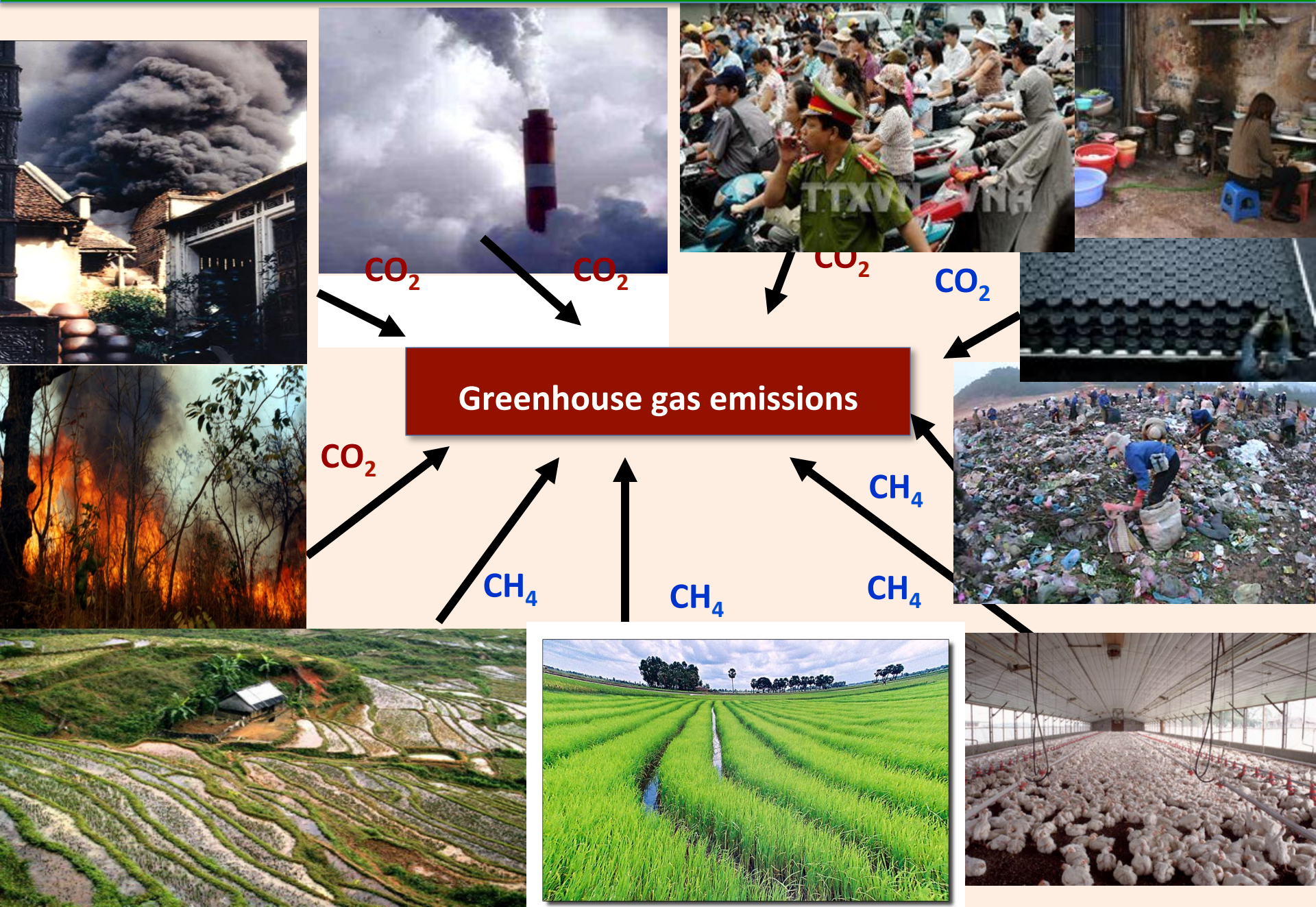
I. VN is one of the most CC vulnerable countries:

1.3. Vulnerability differentiation in time and space

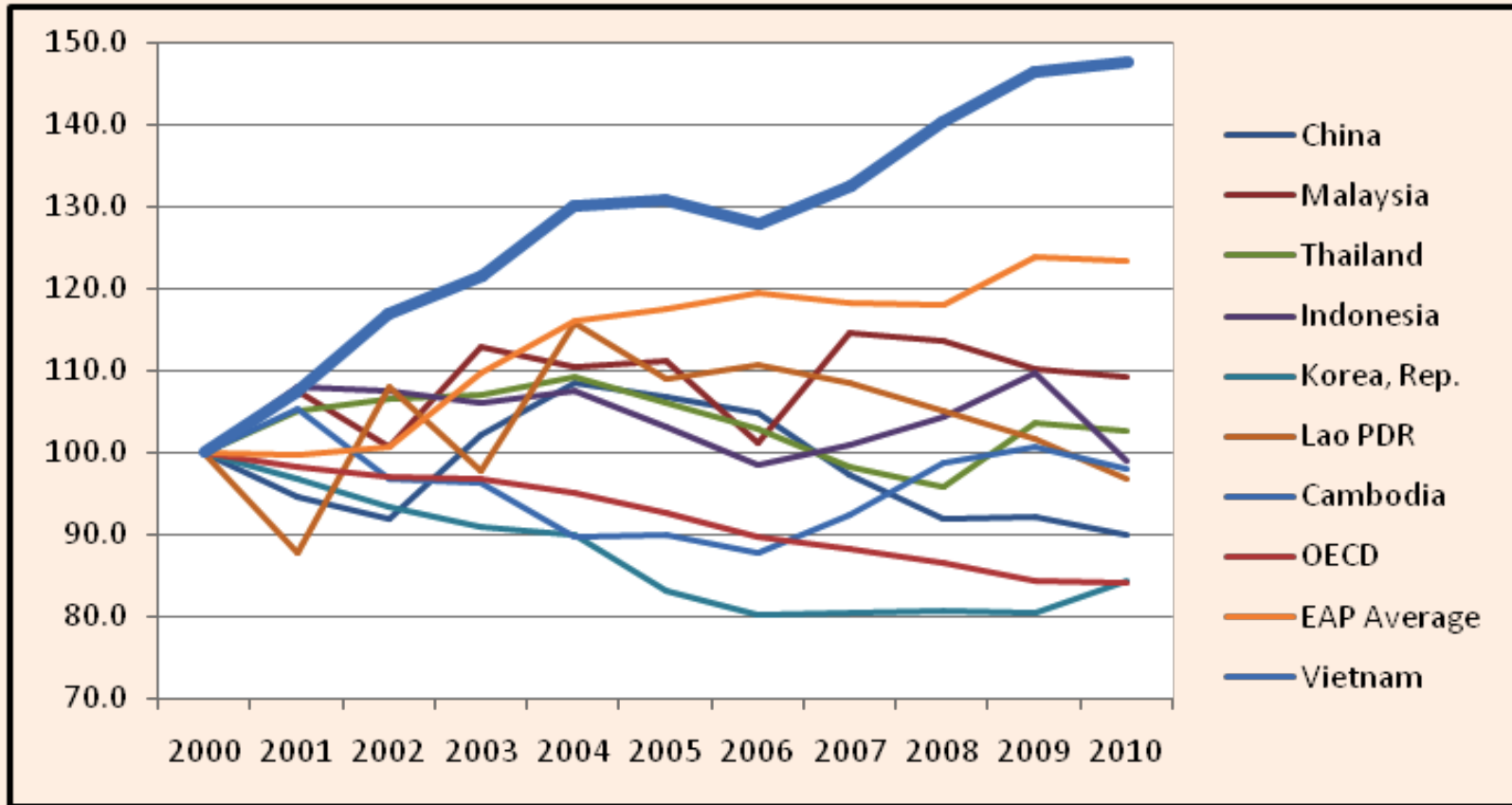
Differentiation of vulnerability to CC in VN



II. Greenhouse gas emissions in Vietnam

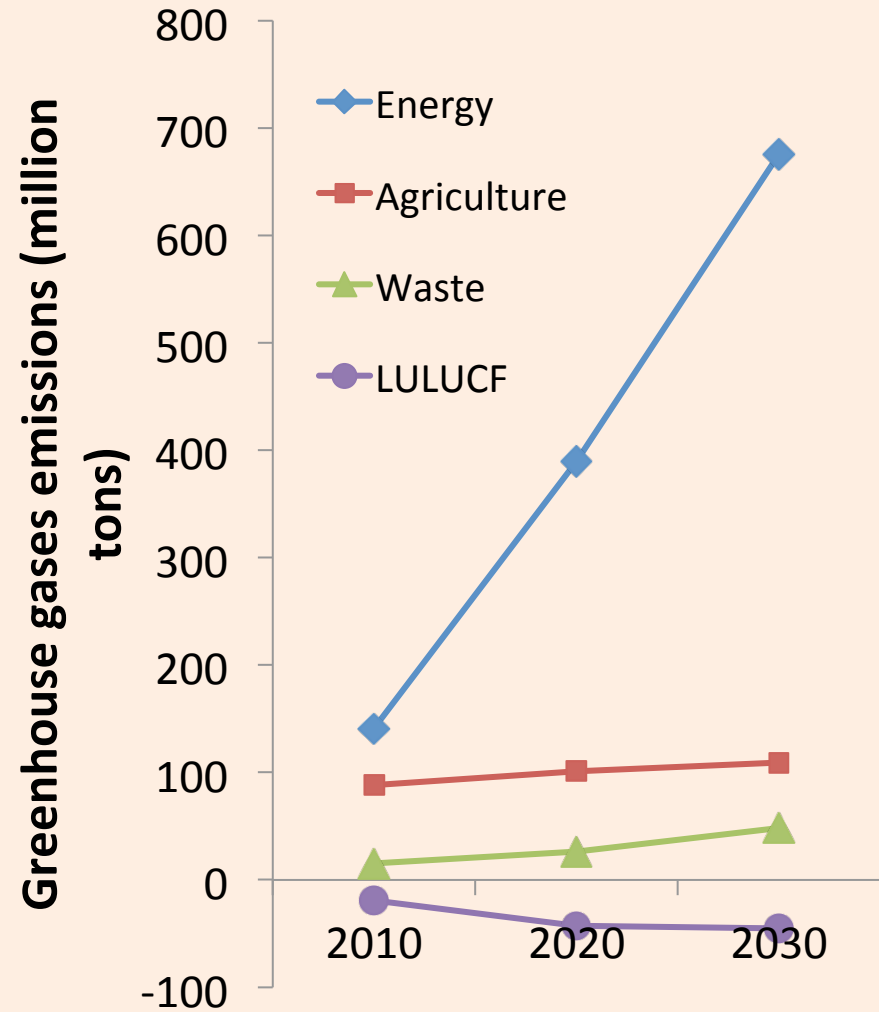
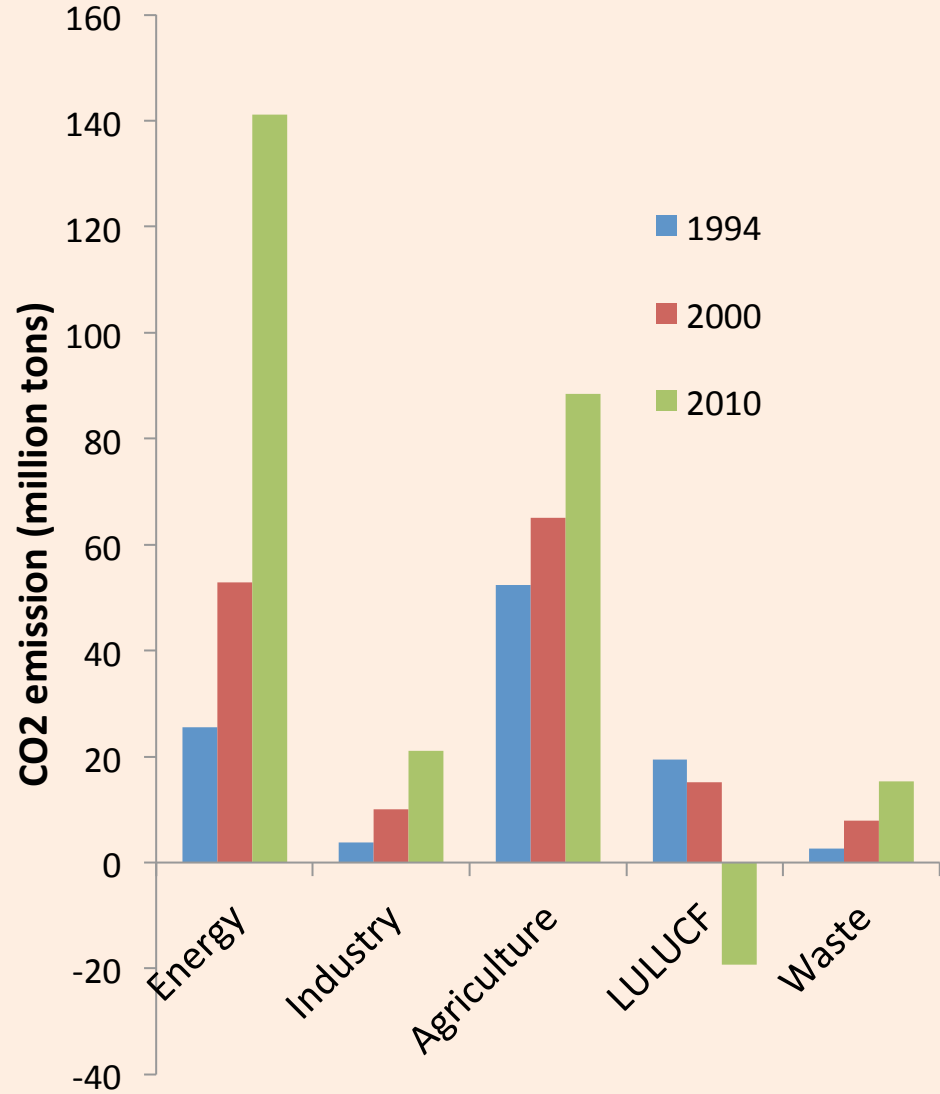


II. Greenhouse gas emissions in Vietnam

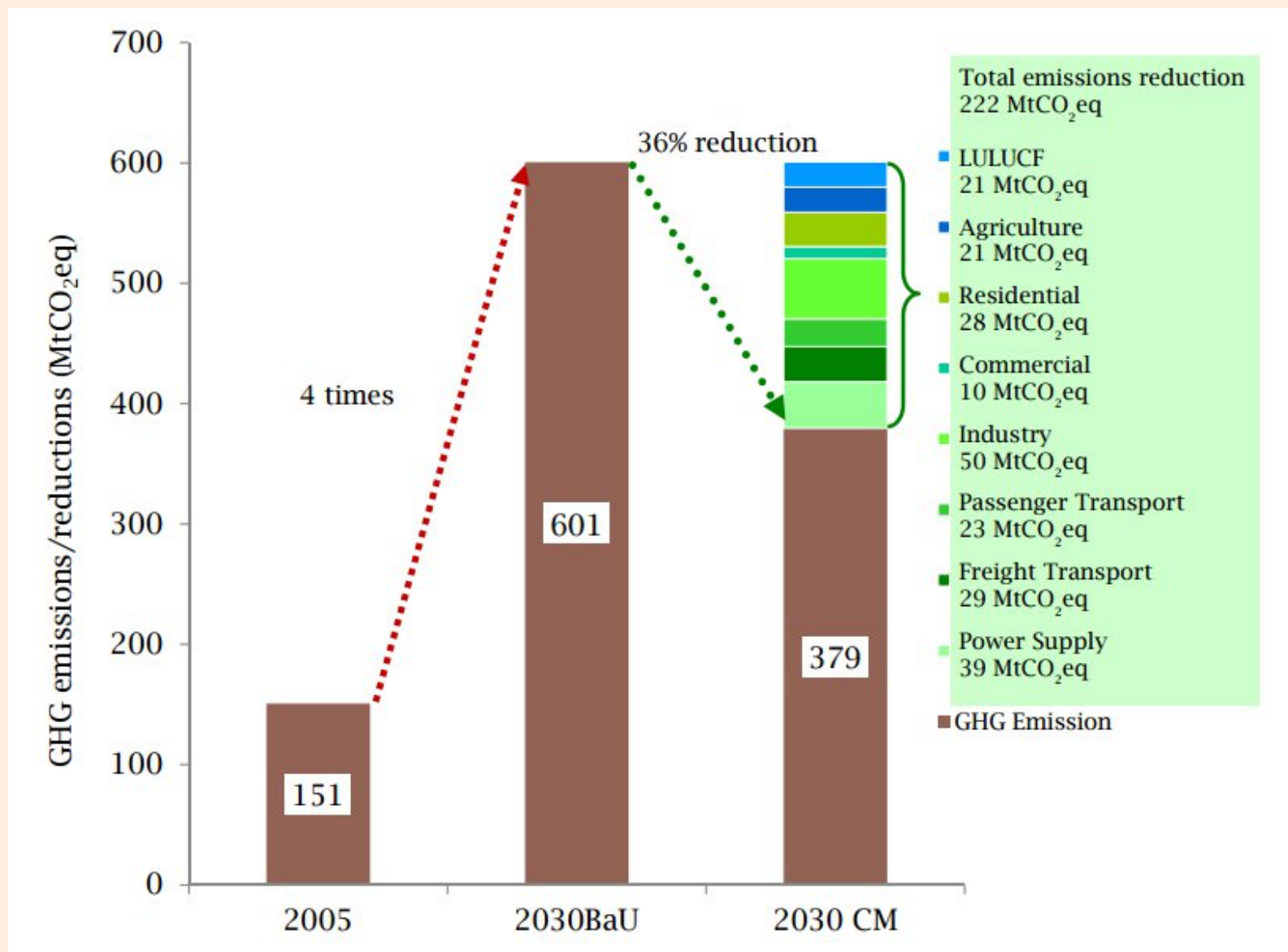


- **VN-One of the fastest growth of GHG emission in the region**
- **CO₂ intensity of GDP increased more than that of regional average**

II. Greenhouse gas emissions in Vietnam



II. Greenhouse gas emissions in Vietnam



III. Response to Climate change for SD in Vietnam

3.1. Objectives of response to climate change for SD

- CCR, implementing PAC for sustainable, safe and prosperous life, society and whole Vietnam, contributing to global mitigation of GHG and realizing SDGs
- To ensure faster to develop the socio-economy, environment protection and biodiversity conservation and efficient response to CC
- To build a new growth model for taking new CC opportunities, transforming the CC challenges for SD and sustainability



III. Response to Climate change for SD in Vietnam

3.3. Most important achievements

1. Development, integration of policy and institution on CCR, including green growth strategies, NAMA, INDC into development policies, strategies

2. CC Science, technology achievements, CC scenarios based models of CCR for SD

3. Promoting social power to CC response: living with floods, drought, living with climate change; CC adaptation, CC mitigation

4. Proactively response to natural disasters & CC through resource sustainable use planning based on vulnerability assessment

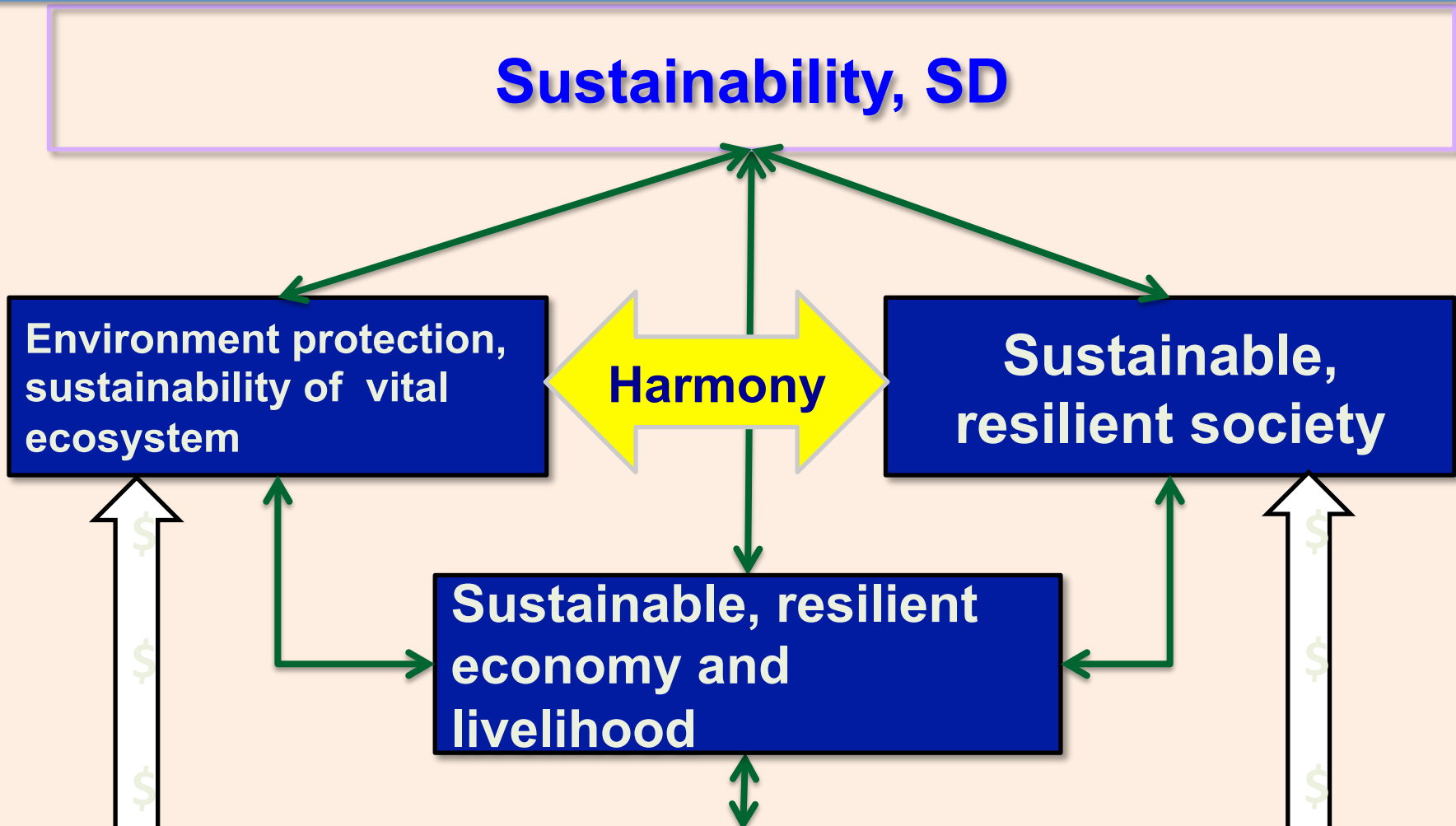
5. Effective development and enhancement of international cooperation to climate change response

6. Development of human, financial resources for CCR

7. Developing science and technology for CCR.

**CCR
for SD**

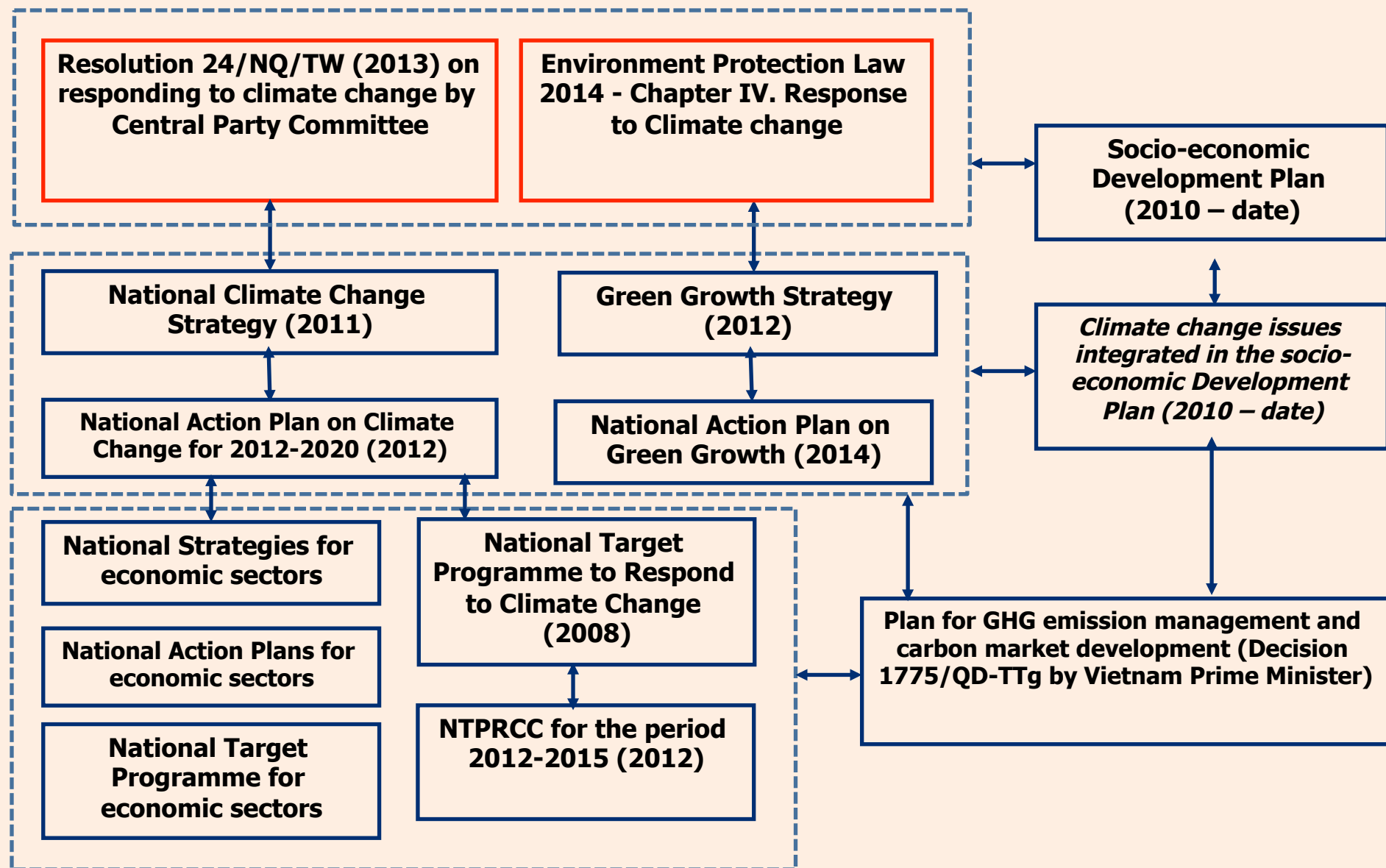
III. Response to Climate change for SD in Vietnam



Science, technology and human resource development, smart governance. Taking the opportunities, transforming the challenges into SD

III. Response to Climate change for SD in Vietnam

3.3. Integration climate change response to development plans (Pre-2020)



III. Response to Climate change for SD in Vietnam

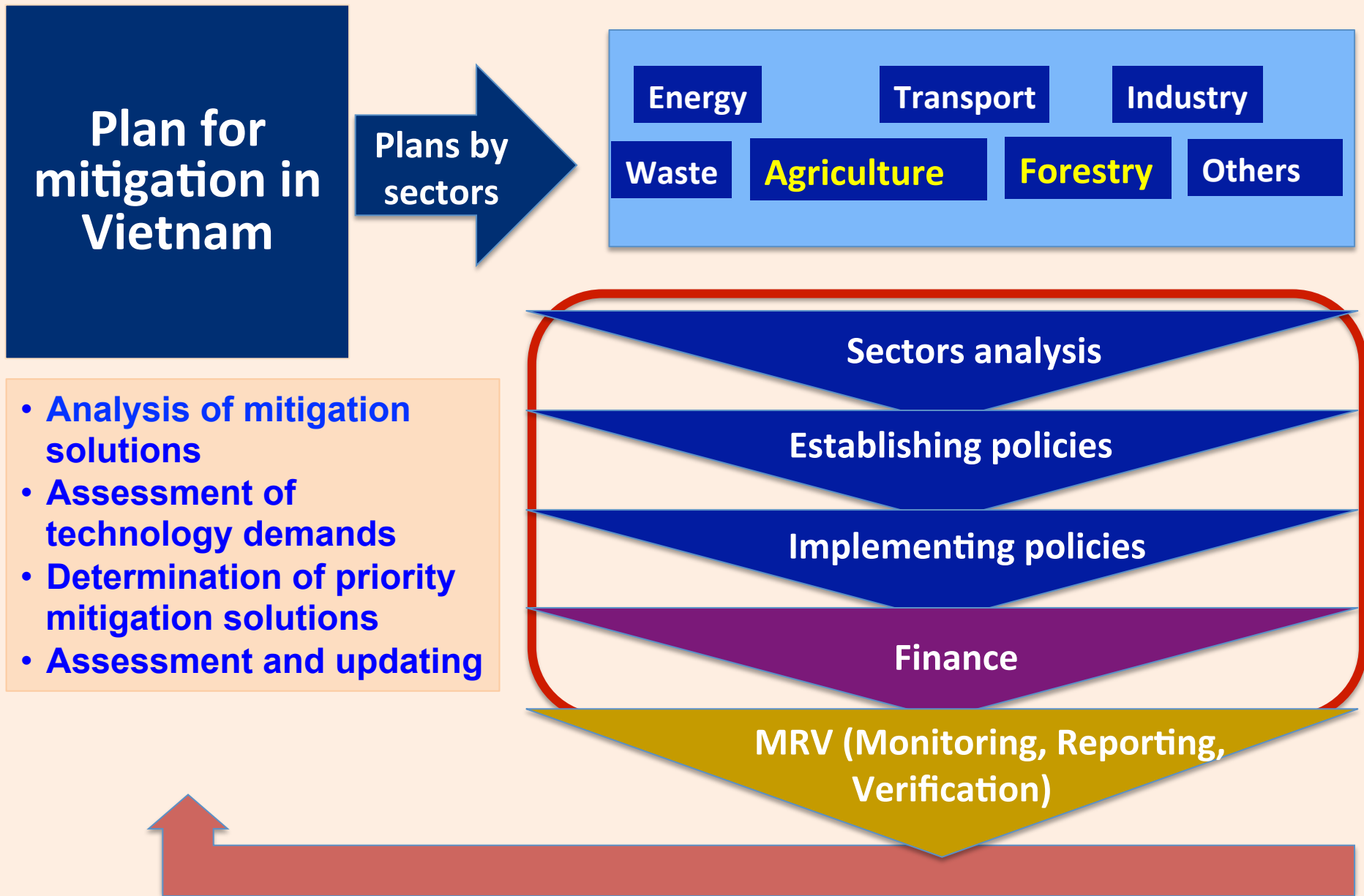
3.4. Climate change mitigation measures

Contribution to GHG emission reductions

- **Scope of works:**
 - Energy
 - Agriculture
 - LULUCF
 - Waste
- **Target GHG:**
 - Carbon dioxide (CO₂),
 - Methane (CH₄),
 - Nitrous oxide (N₂O),
 - Hydro fluorocarbons (HFCs),
 - Perfluorocarbons (PFCs),
 - Sulfur hexafluoride (SF₆).
- **BAU:**
 - 2010: 225.6 million tCO₂e
 - 2020: 474.1 million tCO₂e
 - 2030: 787.4 million tCO₂e
- **Contribution (no support)**
 - By 2030, with only domestic resources: reduce by 8% total GHG emissions compared to BAU, including:
 - Increase renewable energy to 4% of the total electrical energy
 - Increase forest cover of 45%.
- **Contribution (with international support)**
 - By 2030, with only domestic resources: reduce by **25%** total GHG emissions compared to BAU, including:
 - **30-35%** emission intensity per unit of GDP compared to 2010.
 - Increase renewable energy to **9%** of the total electrical energy

III. Response to Climate change for SD in Vietnam

3.4. Climate change mitigation measures



III. Response to Climate change for SD in Vietnam

3.4. Climate change mitigation measures

Policy documents	Year of approval	Ministry in charge	Fiscal Policy	Environ Policy	Climate Policy		Energy Policy	Econ Policy
					Adap-tation	Miti-gation		
National Target Program to Respond to CC	Dec 2008	MoNRE (Nat.Res.& Environ)			●			
Law on econ. & efficient use of energy	June 2010	MOIT (Industry & Trade)					●	●
Environmental Protection Tax Law	Nov 2010 (tax: Jan 2012)	MOF (Finance)	●	●				
Master Plan for Power Develop. (VII)	July 2011	MOIT (Industry & Trade)					●	●
National CC Strategy	Dec 2011	MoNRE (Nat. Res. & Environ)		●	●	●	●	
Vietnam Green Growth Strategy	Sept 2012	MPI (Planning & Investm.)	●	●	●	●	●	●

Table 2: Overview on selected recent climate and energy related policies in Vietnam indicating addressed policy fields. Note that dark-blue dots mark laws, lighter dots mark strategies and plans that require further implementation.

III. Response to Climate change for SD in Vietnam

3.4. Climate change mitigation measures

Mitigation Priorities:

1. Power Generation

2. Transportation

3. Forestry

4. Agriculture

5. Waste management

Economic pricing of energy; energy efficiency management; renewable energy, low carbon technologies

Electric motorbikes, modal shifts, urban planning

Reduced emissions from deforestation and forest degradation (REDD)

Reducing CH₄ from livestock waste; from rice warrants more research and attention

Better management of solid waste and domestic and industrial wastewaters to reduce CH₄ emissions

III. Response to Climate change for SD in Vietnam

3.4. Climate change mitigation measures : INDC:

- **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 no-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**

III. Response to Climate change for SD in Vietnam

3.4. Climate change mitigation measures

Options for improvement in energy efficiency

1. Improvements in lighting efficiency of energy use and conservation

Setting up lighting norms and saving regulations.

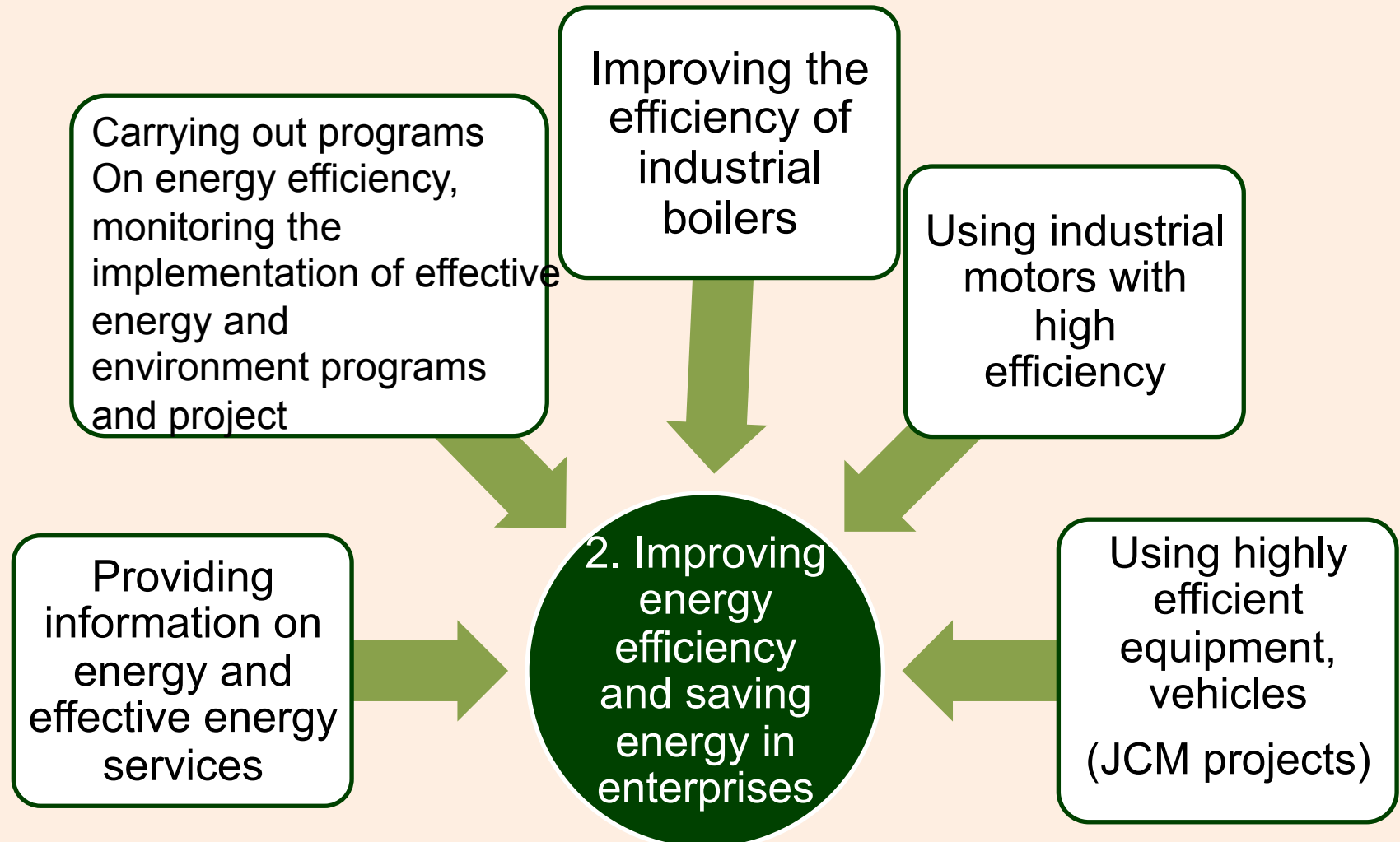
Supporting policies for enterprise in lighting manufacture, management and education.

Improving lighting efficiency in public and households.

III. Response to Climate change for SD in Vietnam

3.4. Climate change mitigation measures

Options for improvement in energy efficiency



III. Response to Climate change for SD in Vietnam

3.4. Climate change mitigation measures

Options for improvement in energy efficiency

3. Implementation of Demand-side Management (DSM) Programs

Management of additional load to reduce the differences between electricity power availability and consumption

Reduction of losses in electricity dissemination/ transmission and distribution

Development and implementation of a program on high-efficiency household appliances

Development and implementation of a program on urban energy efficiency and rural electrification

III. Response to Climate change for SD in Vietnam

3.4. Climate change mitigation measures

Options for improvement in energy efficiency

4. Effective energy use and saving in buildings:

Strengthening capacity in construction design taking into account energy efficiency

Setting up energy norms for construction materials.

Conducting energy audit on big buildings.

Standardizing and encouraging the use of high-efficiency equipment.

III. Response to Climate change for SD in Vietnam

3.4. Climate change mitigation measures

Options for improvement in energy efficiency

5. Economical use of energy in transport sector

Developing public transport for cities to meet 25-30% of transportation needs in 2001-2010 and up to 50-60% by 2010- 2020

Controlling gas emissions from vehicles

Upgrading transport infrastructure and improving the quality of means of transportation

Encouraging economical-fuel vehicles

III. Response to Climate change for SD in Vietnam

3.4. Climate change mitigation measures: Lower-Carbon Energy Consumption



50-60% of Vietnamese enterprises use outdated or worn-out technologies:
More opportunities for JCM

1. Efforts to introduce more-efficient energy-use equipment can reduce Vietnam's energy consumption overall (and reduce emissions);

2. Efforts to shift demand from peak hours to off-peak hours probably have a limited impact on emissions mitigation;

3. Be evaluated for their energy efficiency outcomes rather than their demand management outcomes;

4. Energy efficiency investments are lower-cost than other options to reduce emissions from the electricity sector, such as shifting generation away from coal to other energy sources;

5. Concentrating energy conservation efforts on appliances. It estimates that energy savings of 7-8 % compared with a business-as-usual scenario should be possible for appliances and savings of some 2% for lighting

III. Response to Climate change for SD in Vietnam

3.4. Climate change mitigation measures: Lower-Carbon Energy Consumption



a

Construct a strong and sustainable institutional platform for energy efficiency initiatives delivering large and measurable energy savings;

b

Focus on: multi-sectorial in urban planning; energy efficiency measures in industries, buildings, homes, institutions and offices; transport-specific measures; and others.

III. Response to Climate change for SD in Vietnam

3.4. Climate change mitigation measures

The potential of New renewable: High

Table 3: Assessment of the potential for renewable energies to supply electricity in Vietnam

Energy resources	Economical potential	Current development in 2005	Future development planned up to 2025 by Vietnamese agencies
Hydro + Large (>30 MW) + Small (<30 MW) + Mini (<1 MW)	84 TWh/yr 18-20 GW 2-4 GW 100 MW	Approx. 4200 MW Equiv. to 18 TWh/yr exploited from hydro	16.6 GW by 2020 2.5-3.2 GW 10.2 GW
Hydro pump storage	10.2 GW	Negligible	10.2 GW
Geothermal	1.4 GW	Negligible	300-400 MW by 2020
Wind energy	120.5 GW*	Negligible	500 MW
Solar energy	1 GW (3)	Negligible	2-3 MW
Rice husk	250 MW	Negligible	
Paddy straw	550 MW	Negligible	500 MW
Bagasse	200 MW	Negligible	
Wood residue	100 MW	Negligible	

* This economical potential of wind energy in Vietnam is estimated with different feed-in tariffs varying from 5 to 8 US\$cent/kWh.

Source: Nuygen and Ha-Duong (2009), including sources of data.

III. Response to Climate change for SD in Vietnam

3.4. Climate change mitigation measures

The potential of New renewable

- Small hydro, geothermal and biomass technologies (excluding wood energy): **biggest potential** for Vietnam as cost-effective alternative energy sources to feed into the national grid;
- **Renewables**: play an even more important role in the electrification of the **70% of Vietnamese living in remote areas** without access to the national grid;
- The use of **small hydro, geothermal and biomass** technologies: **save US\$ 1.3 billion** in total discounted cost of power generation;
- Wind energy: be economically viable if its technology **cost falls** to approximately **900 US\$/kW** in the context of high fuel prices.

III. Response to Climate change for SD in Vietnam

3.4. Climate change mitigation measures: by sectors

1. Energy Sector

New renewable: remains small and is expected to contribute just 2.7% (or 2,300 MW) of total power generation capacity by 2025

Solar energy

Highest potential found in the central and south-central highlands and the south, Vietnam. Resource: 1,300-2,200kwh/m2/year

Biomass

Most commonly used sources for biomass-based energy production in Vietnam are wood fuel and agricultural residues (rice husk, rice straw, coffee husk, bagasse etc.)

Small hydro

1,600-2,000 MW, accounting for 7-10% of yield. There are about 500 small hydropower plants (100-10,000kW) = 87-90%, and about 5 - 7 % of micro hydropower plants (5 - 100kW)
610 stations may be installed and exploited with a total output capacity of 1,310MW in 26 provinces

III. Response to Climate change for SD in Vietnam

3.4. Climate change mitigation measures: by sectors

1. Energy Sector

Wind

Greatest potential:
-Southern and south-central coastal areas due to strong winds and high population density;
-Mountains in the central and southern parts of the country.
-Energy density (kwh/m²/year) is
2,700 – 4,500 on remote island, 1,700 – 4,200 on coastal island.

Geothermal

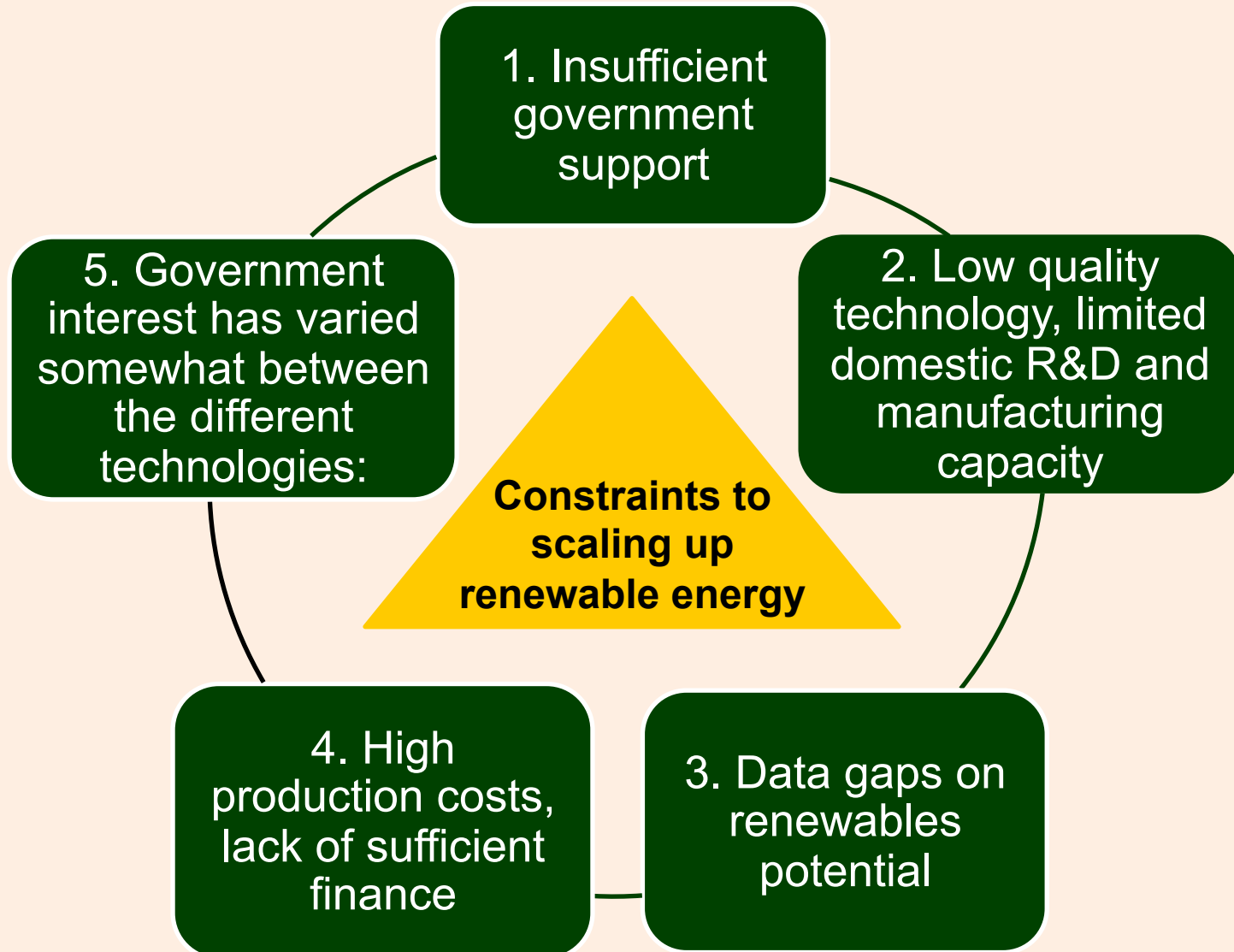
Around 300 hot spring sites are located in the Northwest and Northern and Southern Central regions. 30 sites have been identified as potential sources of geothermal (output of around 340 MW).

Biofuel

Vietnam: significant potential for liquid biofuel production. It has been estimated that 320 million litres of fuel ethanol could be produced using all cane molasses and 10 percent of cassava and corn production.

III. Response to Climate change for SD in Vietnam

3.4. Climate change mitigation measures: by sectors



III. Response to Climate change for SD in Vietnam

3.4. Climate change mitigation measures: by sectors

Solutions to mitigation implementation of renewable energy

(Vietnam Renewable Energy development project to 2030 with outlook to 2050.

Pham Trong Thuc)



a. Sustainable **Energy Promotion Fund** shall be established and financed by the state budget;

b. Policies for **electricity tariff** and guaranteed investment;

c. **Electricity purchase cost for power generation projects** using RE sources shall be accounted into the power entity's electricity tariff, calculated and fully incorporated into electricity retail tariff structure, and recovered from electricity sale revenues;

d. Independent power generation projects **using RE** sources receiving support from the the Sustainable **Energy Promotion Fund**;

e. MoIT determines **minimum proportion of electricity generated from RE sources** by power generation/distribution entities.

III. Response to Climate change for SD in Vietnam

3.4. Climate change mitigation measures: by sectors

Solutions to mitigation implementation of renewable energy

(Vietnam Renewable Energy development project to 2030 with outlook to 2050.
Pham Trong Thuc)

Application of RPS mechanism (Renewable Portfolio Standard):

Power generation

Have their installed capacity of larger than 1,000 MW, proportion of electricity generated from RE sources shall not be less than 3%, 10% and 20% in 2020, 2030 and 2050 respectively;

Power distribution

Generate/**purchase** electricity from RE sources, the proportion shall not be less than 5%, 10% and 20% in 2020, 2030 and 2050 respectively.

III. Response to Climate change for SD in Vietnam

3.4. Climate change mitigation measures: by sectors

Solutions to mitigation implementation of renewable energy (RE)

Develop the national RE programme;

Formulate and expand RE technology market

Market
formulation
and RE
technologies

Establish and develop RE industry;

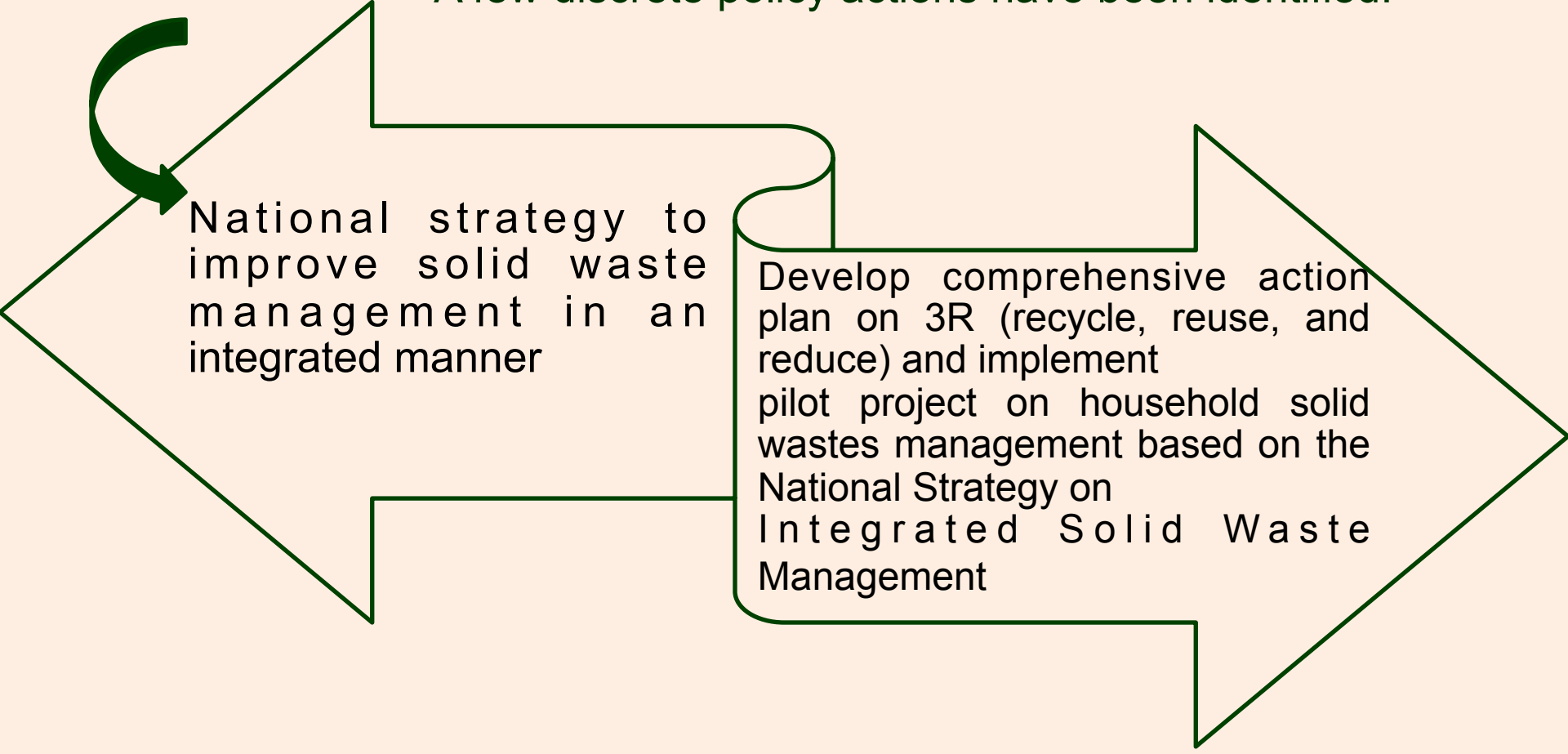
Incentives and other supporting mechanisms:
tax incentives,
preferential treatment
for land, policies for
environment protection,
...

III. Response to Climate change for SD in Vietnam

3.4. Climate change mitigation measures: by sectors

3. Waste management

A few discrete policy actions have been identified:



III. Response to Climate change for SD in Vietnam

3.4. Climate change mitigation measures: by sectors

4. Agriculture

Financial Profitability and Co-benefits of Selected Mitigation Options

	Financial profitability			Major Public Co-benefits					
	Not profitable	Marginal	Profitable	Energy supply	Energy demand	Air/water quality	Ecosystem services	Trade and production	Safety
Agriculture									
Improved efficiency of fertilizer use			Profitable			Air/water quality		Trade and production	
Agricultural residues for power		Marginal	Profitable	Energy supply					
Methane recovery from livestock waste		Marginal	Profitable	Energy supply		Air/water quality			

III. Response to Climate change for SD in Vietnam

3.4. Climate change mitigation measures: by sectors

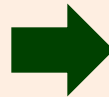
4. Agriculture

Mitigation in Vietnam

Agriculture Waste energy:
Wastewater systems in livestock farms recovering methane for use;
Agriculture waste use and treatment:
Transferred into gas for use later



Energy efficiency and save in agriculture:
considerable potential to reduce these GHG emissions



Changing cropping method reducing carbon, methane released as GHG:
keeping water level in rice field,
Keeping **soils as a carbon sink**, peat land, mangrove sediment

III. Response to Climate change for SD in Vietnam

3.4. Climate change mitigation measures: by sectors

5. Forestry

a. Program of plantation of 5 million hectares of forest (Project 661), increasing the forest coverage up to 43% by the end of the period 2010 -2020;

b. Action plan to prevent degradation of forest resources: a) restore forest by conservation; b) planting of new forest; c) limiting exploitation of natural forest, preventing forest fire;

c. Stabilize structure of 3 kinds of forests: protection forests, special-use forests and production forests;

d. Implement integrated social policies: a) allocating forest land to local households for planting; b) settlement program “poverty alleviation” with the aims of actively supporting the program of planting 5 million hectares of forest.



III. Response to Climate change for SD in Vietnam

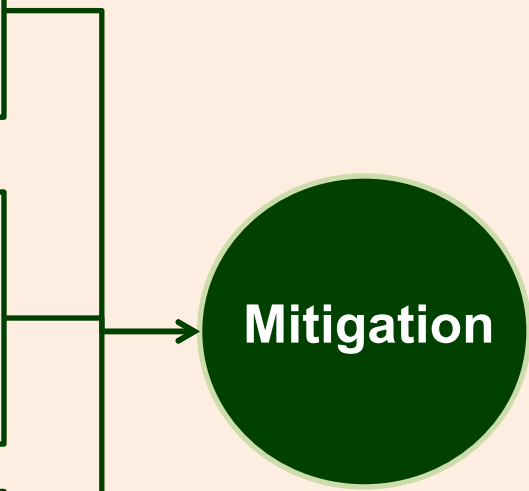
3.4. Climate change mitigation measures: by sectors

5. Forestry

e. Accelerating implementation of forest tenure reforms, institutional strengthening, and need for better forest planning;

f. Improve the living standard of the people in mountainous areas. Attracting local households to participate in activities to protect forests, plant forests and carry out forestry business

g. Socialize at high level forestry on basis of multi-component economy. Renovate production relationship in forestry



III. Response to Climate change for SD in Vietnam

3.4. Climate change mitigation measures: by sectors

5. Forestry

Success in addressing these challenges will also bring wider “co-benefits:

a. Protection of important forest-based ecosystem services such as watershed protection and clear water supply— services;

b. Protection of “provisioning services”—of timber, firewood, NTFPs, and forest grazing— essential for livelihoods, contributing to resilience to environmental, economic stress;

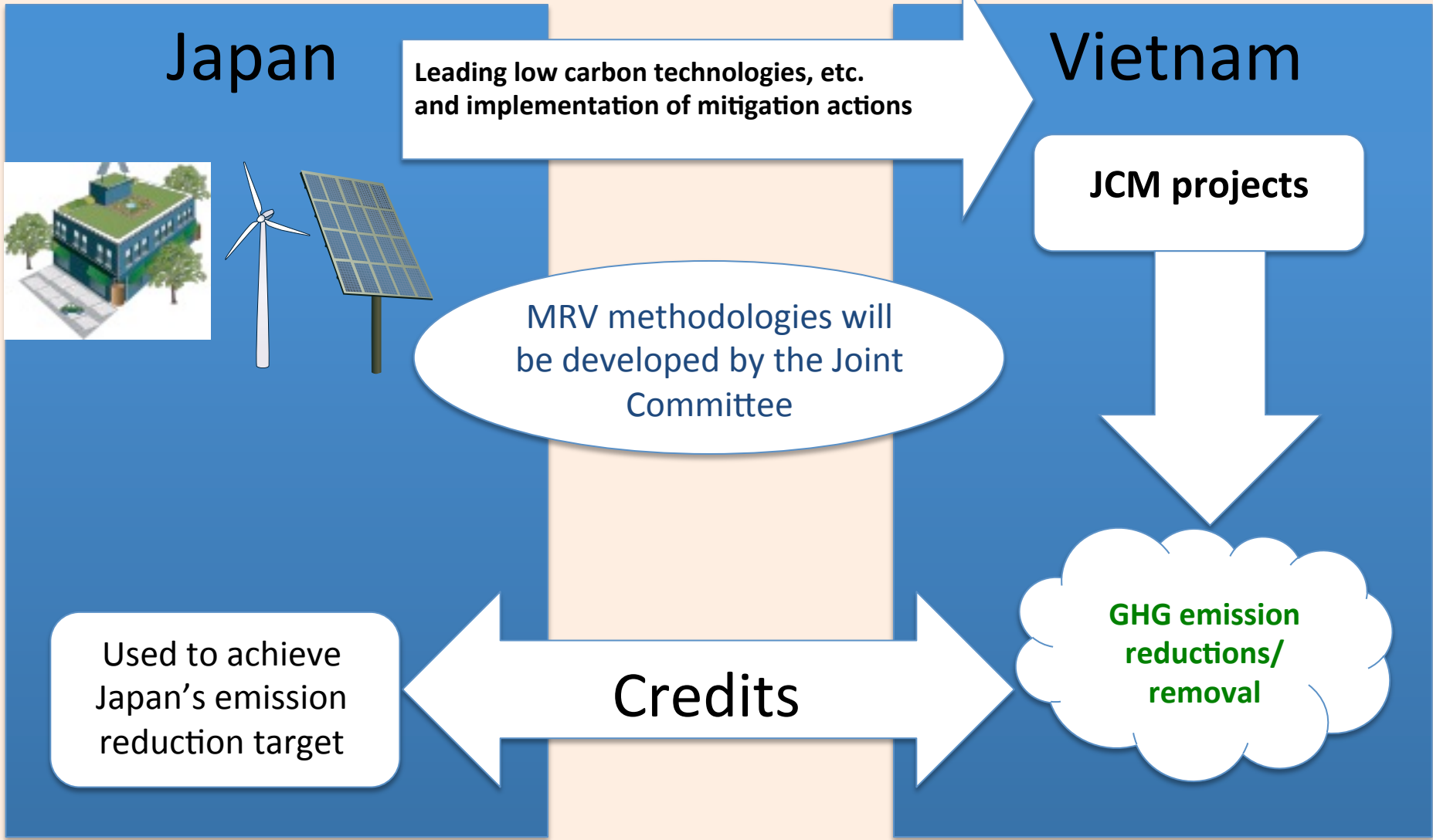
c. Maintaining multi benefits of Conservation of biodiversity— national or global “public good”, delivering livelihood benefits, nature-based tourism, economic benefits.



III. Response to Climate change for SD in Vietnam

3.5. Taking Opportunities for CC mitigation

Joint Crediting Mechanism (JCM)



Note: MRV: measurement, reporting and verification

III. Response to Climate change for SD in Vietnam

3.5. Taking Opportunities for CC mitigation

- Joint Crediting Mechanism (JCM)
 - Energy saving, efficiency
 - Waste treatment
 - Produce renewable energy
 - Low carbon livelihoods
 - Smart economic development models: Agriculture, aquaculture, urban, etc.



Green technology



Energy efficiency in factories, hospital, schools




REDD+





III. Response to Climate change for SD in Vietnam


3.5. Taking Opportunities for CC mitigation

Joint Crediting Mechanism (JCM)

 **18/9/2013**
First Joint Committee Meeting
Signing Ceremony for adoption of the “Guidance for the Implementation of the Joint Crediting Mechanism” and the “Joint Crediting Mechanism Rules of Procedures for the Joint Committee”
Discussion on other rules and guidelines for adoption

 **17/2/2014**
Second Joint Committee Meeting
Adopted rules and guidelines to be followed for the pilot phase of the JCM implementation between Vietnamese side and Japanese side
Discussion on the potential projects

 **14/1/2015**
Third Joint Committee Meeting
Adopted 3 proposed methodologies
Discussion on proposed revised “Joint Crediting Mechanism Rules of Procedures for the Joint Committee”, “Joint Crediting Mechanism Guidelines Project Cycle Procedures” and “Joint Crediting Mechanism Guidelines for Designation as a Third-Party Entity”

 **4/8/2015**
Fourth Joint Committee Meeting
1st JCM registered project
Discussion on proposed amendments to the “Guidance for the Implementation of JCM”, “JCM Credits Issuance Request Form” and “JCM Project Cycle Procedures”

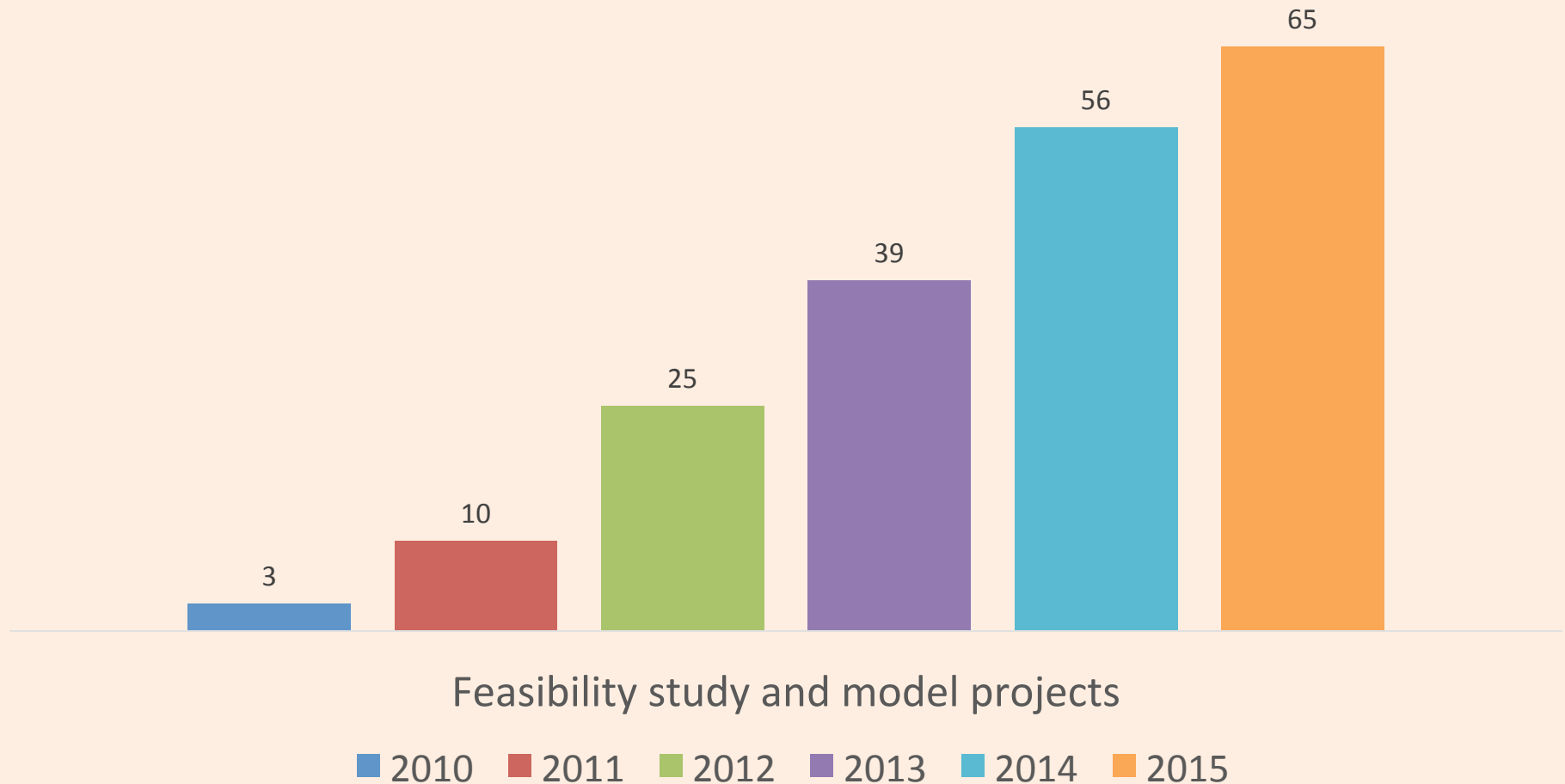
 **8/12/2015, 2016**
3rd, 4th High level meeting in COP21
2nd, 3rd JCM registered
Vice Minsitrers attended the meeting and taking with Minister of Environment Japan and representatives of new partner countries of the JCM (Arabia Saudi, Chile, Myanmar and Thailand)

III. Response to Climate change for SD in Vietnam

3.5. Taking Opportunities for CC mitigation

Joint Crediting Mechanism (JCM)

NUMBER OF JCM FEASIBILITY STUDIES, PLANNING STUDIES, MODEL AND DEMONSTRATION PROJECTS



III. Response to Climate change for SD in Vietnam

3.5. Taking Opportunities for CC mitigation

Joint Crediting Mechanism (JCM) - Workshops

Workshop 1



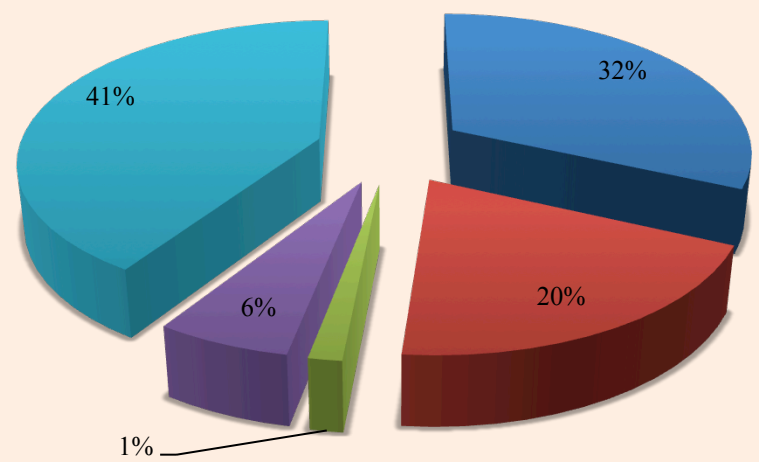
WORKSHOP

Exploring opportunities and challenges for Joint Crediting Mechanism projects for development of low-carbon society in Vietnam

Hanoi, January 24th, 2015

Participants attended

■ Academia ■ Business ■ Industry ■ Media ■ Policymaker



III. Response to Climate change for SD in Vietnam

3.5. Taking Opportunities for CC mitigation

Joint Crediting Mechanism (JCM) - Workshops



Workshop 2

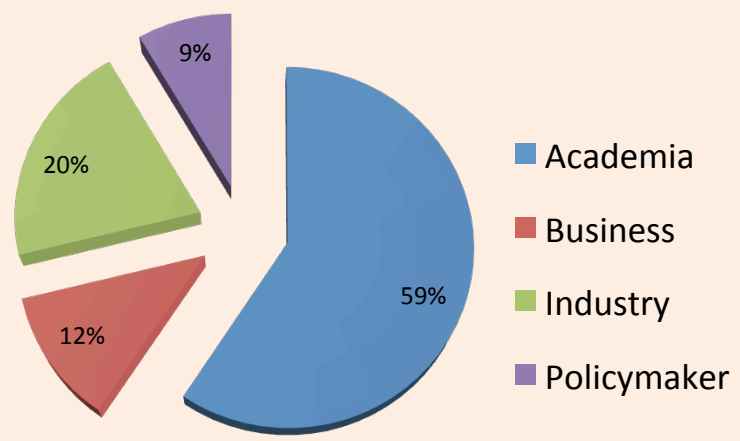
WORKSHOP

3E Nexus and Development of Joint Crediting Mechanism (JCM) projects for Implementing Intended Nationally Determined Contributions

Mô hình tích hợp 3E và Phát triển các dự án cơ chế tín chỉ chung (JCM) thực hiện Đóng góp dự kiến do quốc gia tự quyết định (INDC)

Tuesday, December 15th, 2015
Hanoi, Vietnam

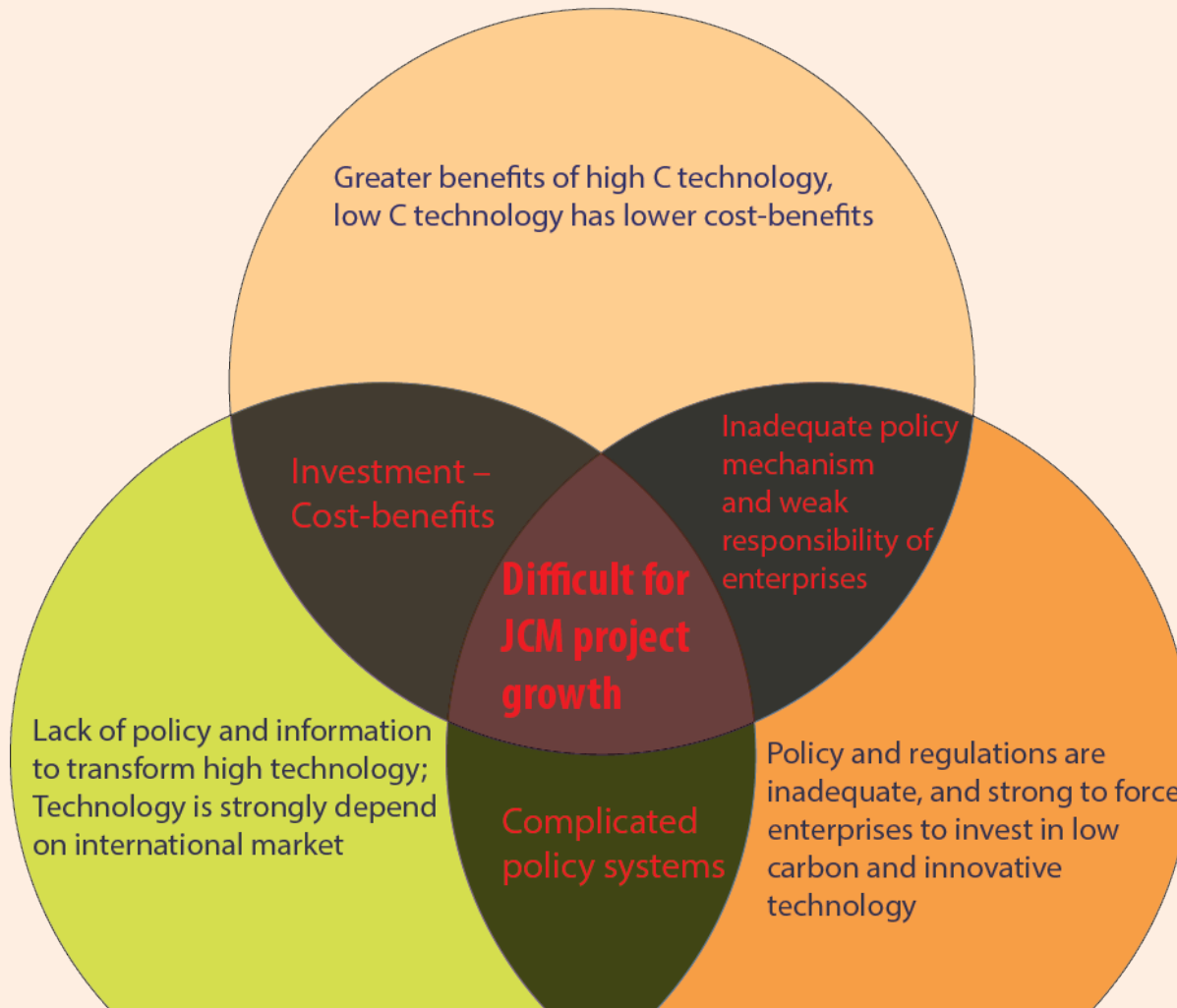
Participants attended



III. Response to Climate change for SD in Vietnam

3.5. Taking Opportunities for CC mitigation

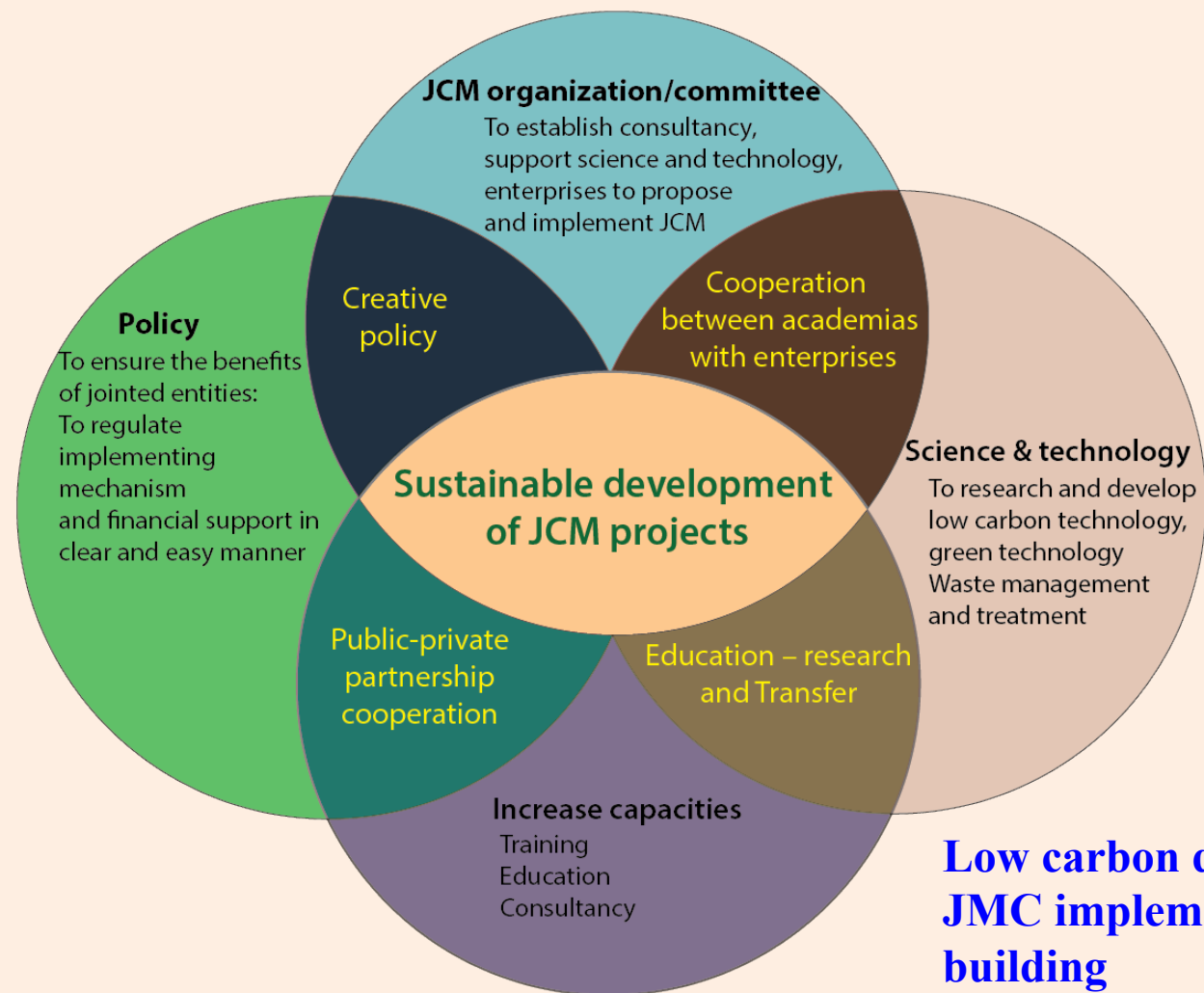
Challenges to Joint Crediting Mechanism (JCM)



III. Response to Climate change for SD in Vietnam

3.5. Taking Opportunities for CC mitigation

Solutions- Future steps for promoting **Joint Crediting Mechanism**



Low carbon development and JMC implementing Capacity building

III. Response to Climate change for SD in Vietnam

3.6. Green, sustainable livelihood

- **Diverse Sustainable Livelihoods (SL)**

Japan: Satoyama, Satoumi Models

China: Harmonious Society Development, eco-community,

Indonesia: community-based conservation

Vietnam: Traditional VAC, Modern VAC

- **Climate smart agriculture:**

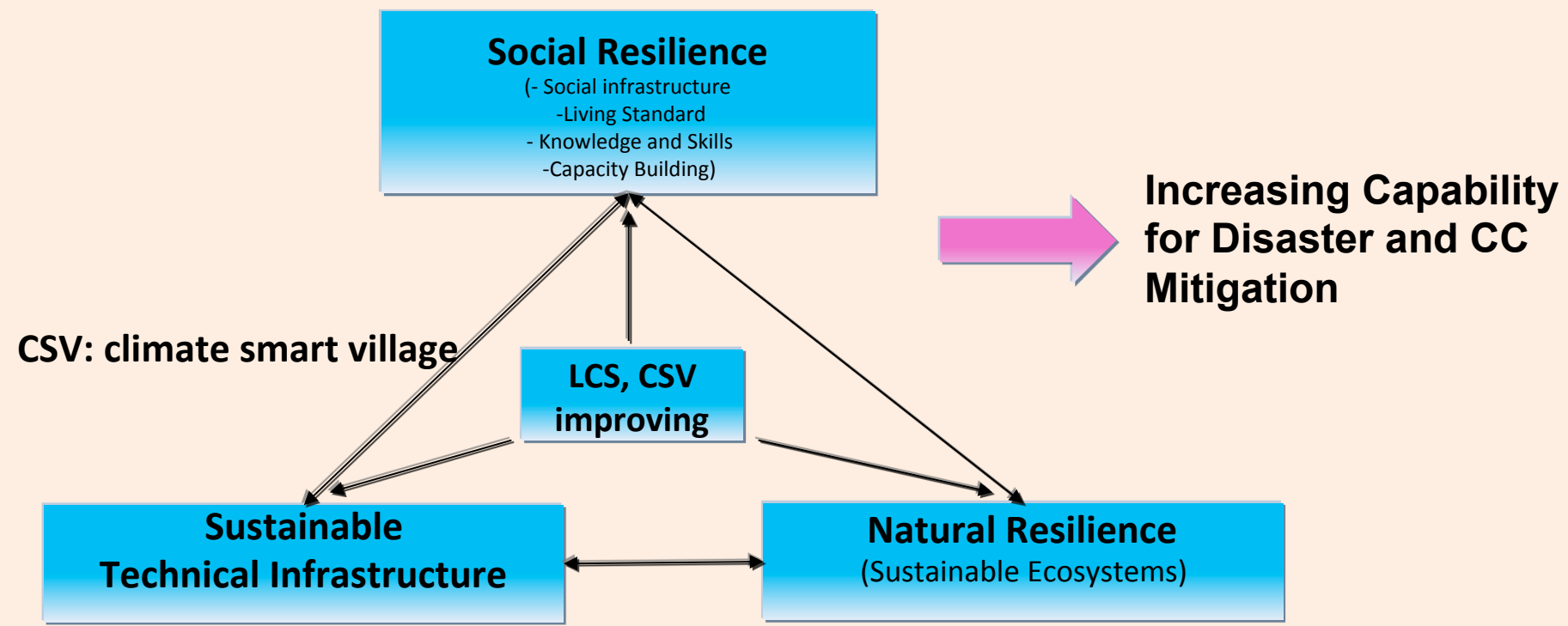
Sustainable agriculture with improved production, clean food production, reduced GHG and ecological change and enhanced resilience.

VAC= Garden + Aquaculture pond+ Breeding facility (for Livestock)

III. Response to Climate change for SD in Vietnam

3.6. Green livelihood

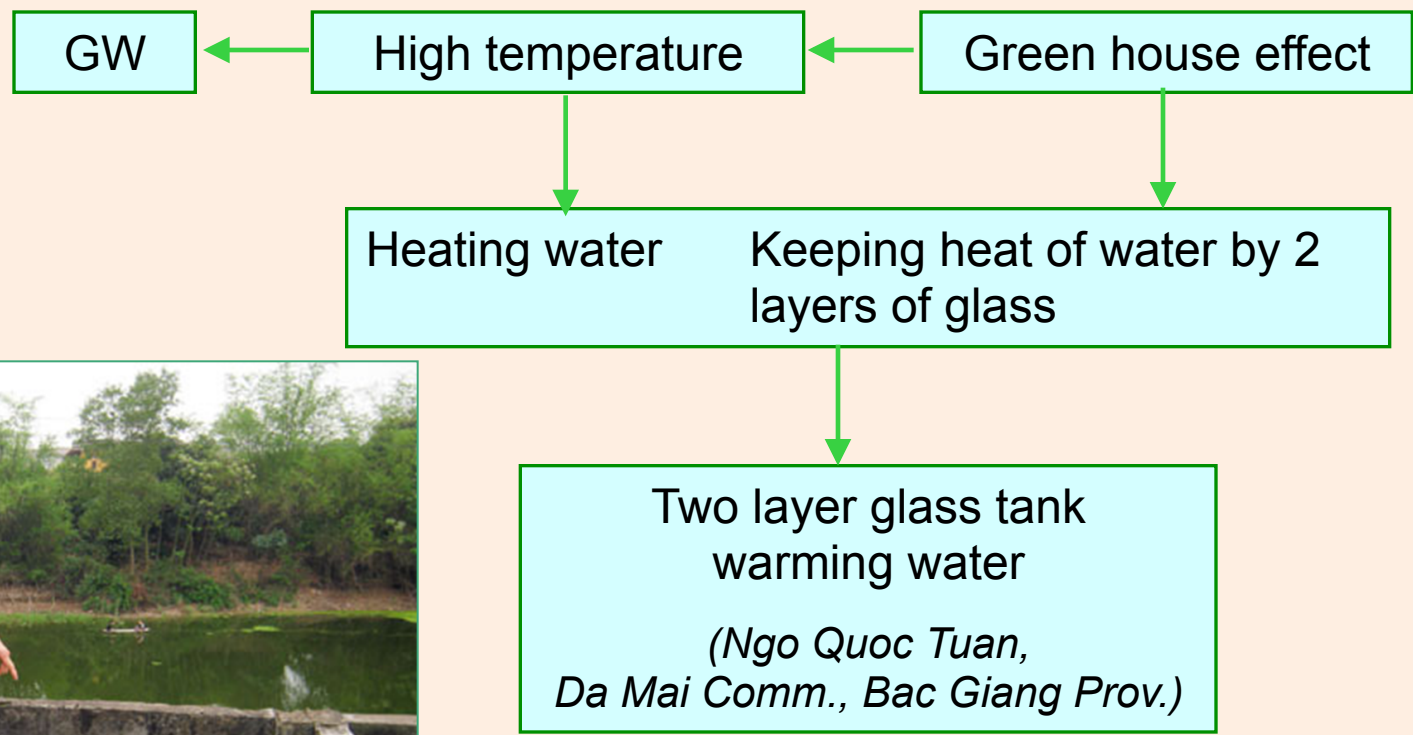
- **Sustainable Livelihood** is Improving Social and nature Resilience and sustainable society
 - Social infrastructure
 - Living standards
 - Knowledge and skills
- } Increase Adaptive Capacity and Disaster Mitigation



III. Response to Climate change for SD in Vietnam

3.7. Social innovation for reducing GHG emission

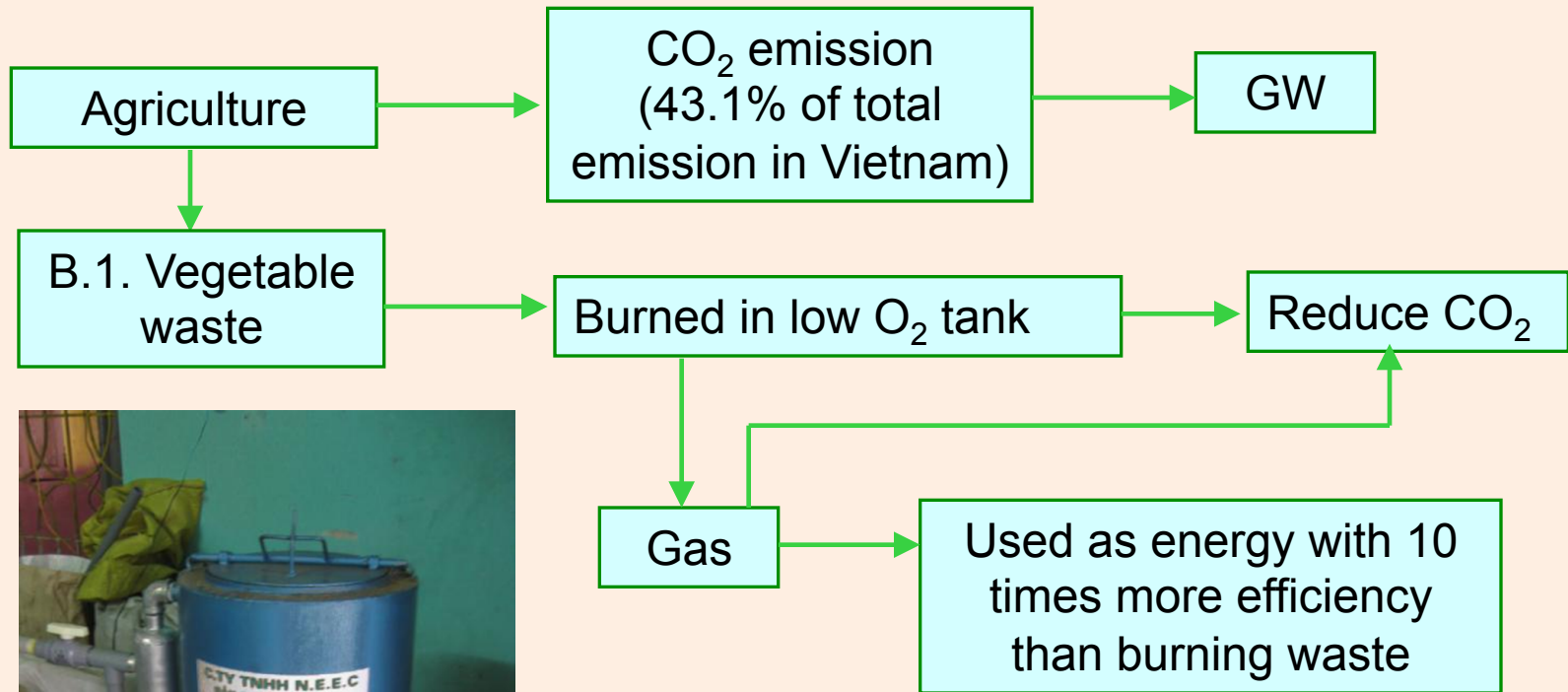
A. Using global warming (GW) as energy:



III. Response to Climate change for SD in Vietnam

3.7. Social innovation for reducing GHG emission

B. Transferring agriculture waste into gas:



III. Response to Climate change for SD in Vietnam

3.7. Social innovation for reducing GHG emission

B. Transferring agriculture waste into gas:



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

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

130.000 biogas
cellars built

Biogas (~510,952
carbon certificates)

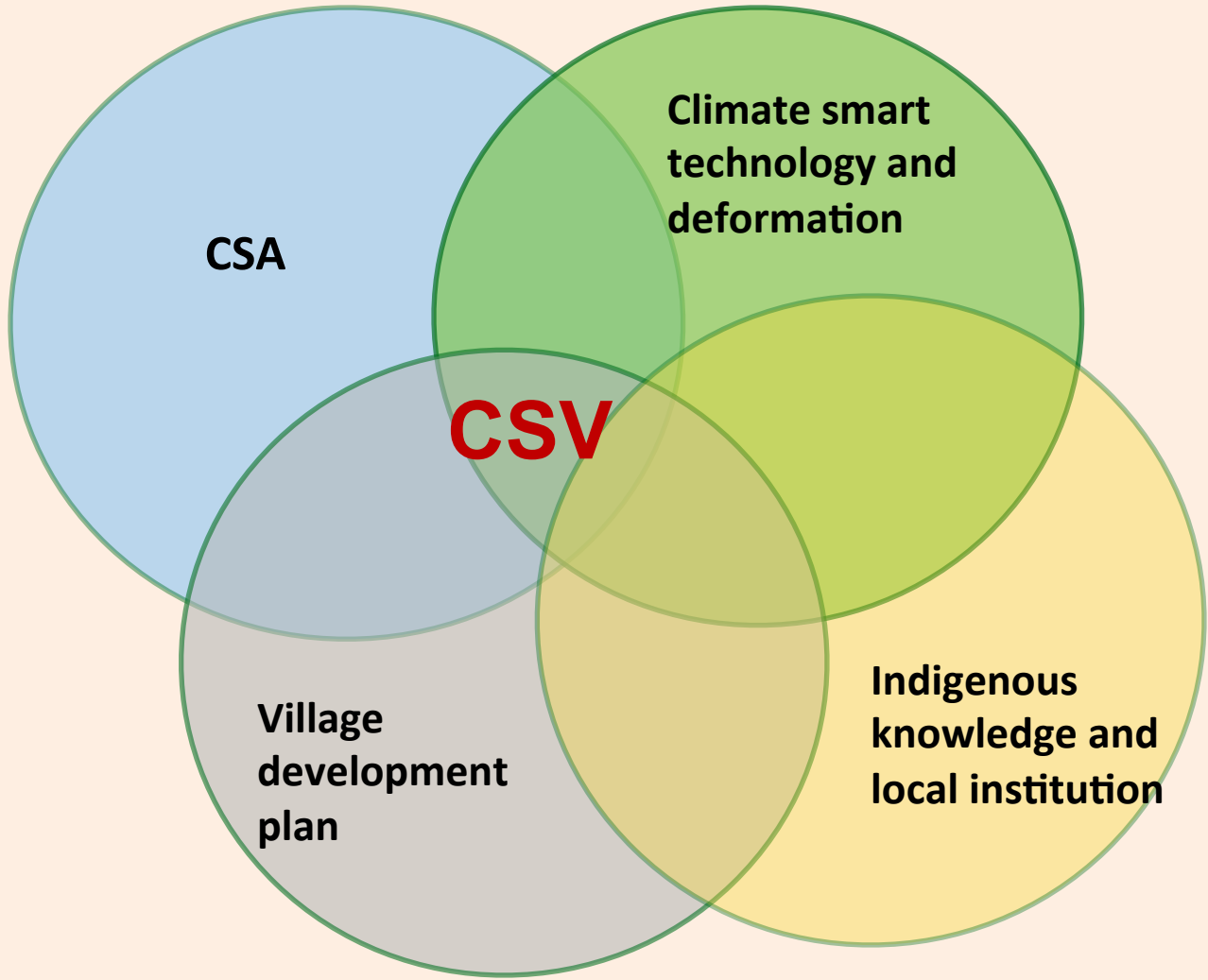
Decreasing 5 tons CO₂ /
household / year

III. Response to Climate change for SD in Vietnam

3.8. Climate Smart Villages (CSV) for CCR and SD

Model of CSV

CSA-climate smart agriculture



III. Response to Climate change for SD in Vietnam

3.8. Climate Smart Villages (CSV) for CCR and SD

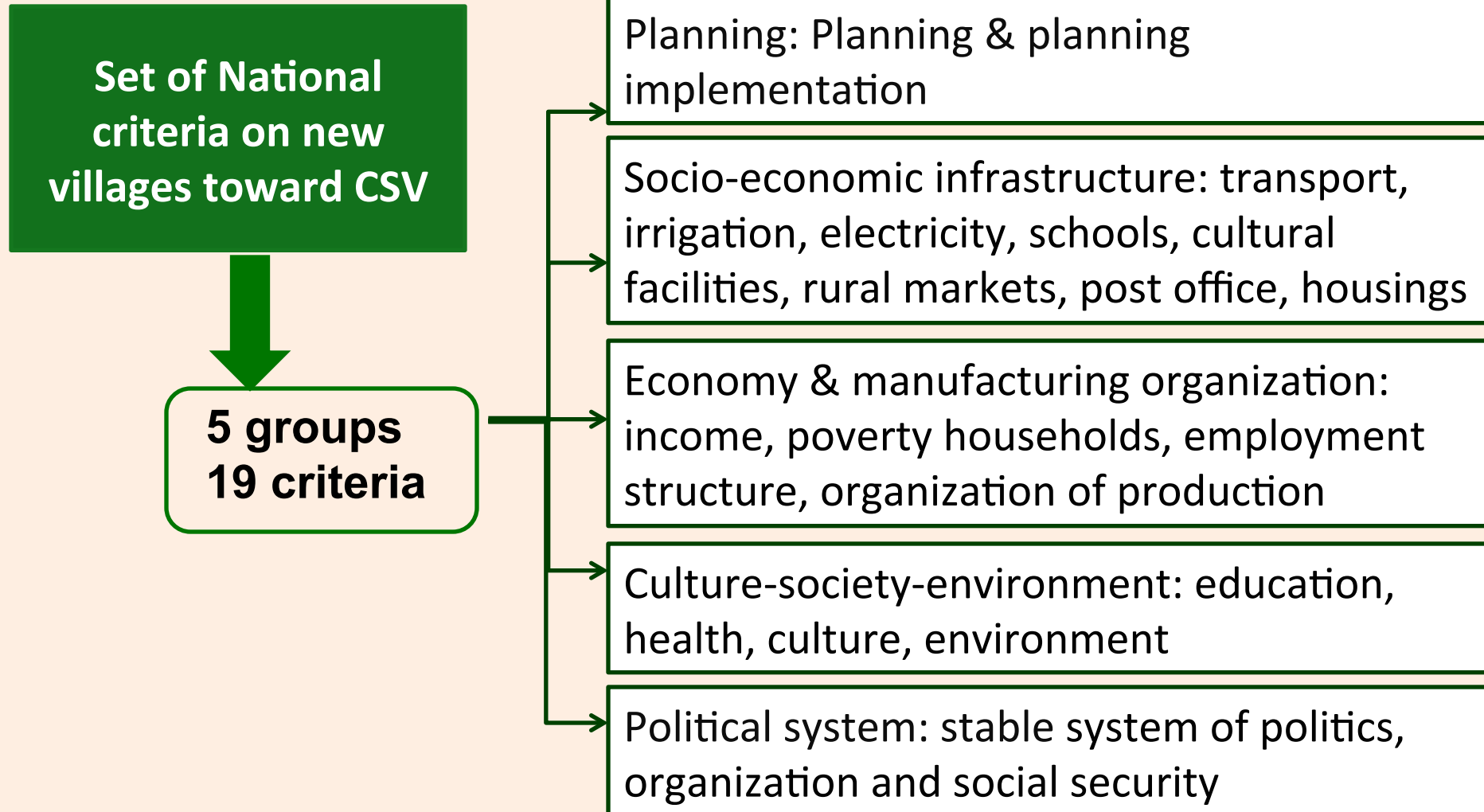
Some activities of climate smart village (CSV)

Climate Smart Village-new village

Weather smart	Water smart	Carbon Smart	Nutrient smart	Knowledge smart	Cropping smart	Disaster mitigation
<ul style="list-style-type: none">- Weather forecast by ICT and information transferred by mass media to farmers	<ul style="list-style-type: none">- Reservoir building and management- Run water harvesting- Community base and on farm water management- Water supply business	<ul style="list-style-type: none">- Agroforestry, forest garden- Planting Jatropha, Pongamia, Pinatta biofuel production in Tay Ninh, Quang Tri province- Biofuel from organic waste- Keeping solar energy in water tank (Bac Giang pro)	<ul style="list-style-type: none">- Site specific nutrient management-Increasing organic fertilizer reducing synthetic ones-Cropping/ legumes	<ul style="list-style-type: none">- Farmer to farmer learningPost house based information center- Learning by doing, training on farm- Water civilization for CSA, CSV	<ul style="list-style-type: none">-Changing crop patterns and seed according to climate change	<ul style="list-style-type: none">- Rice terrace- Living with flooding

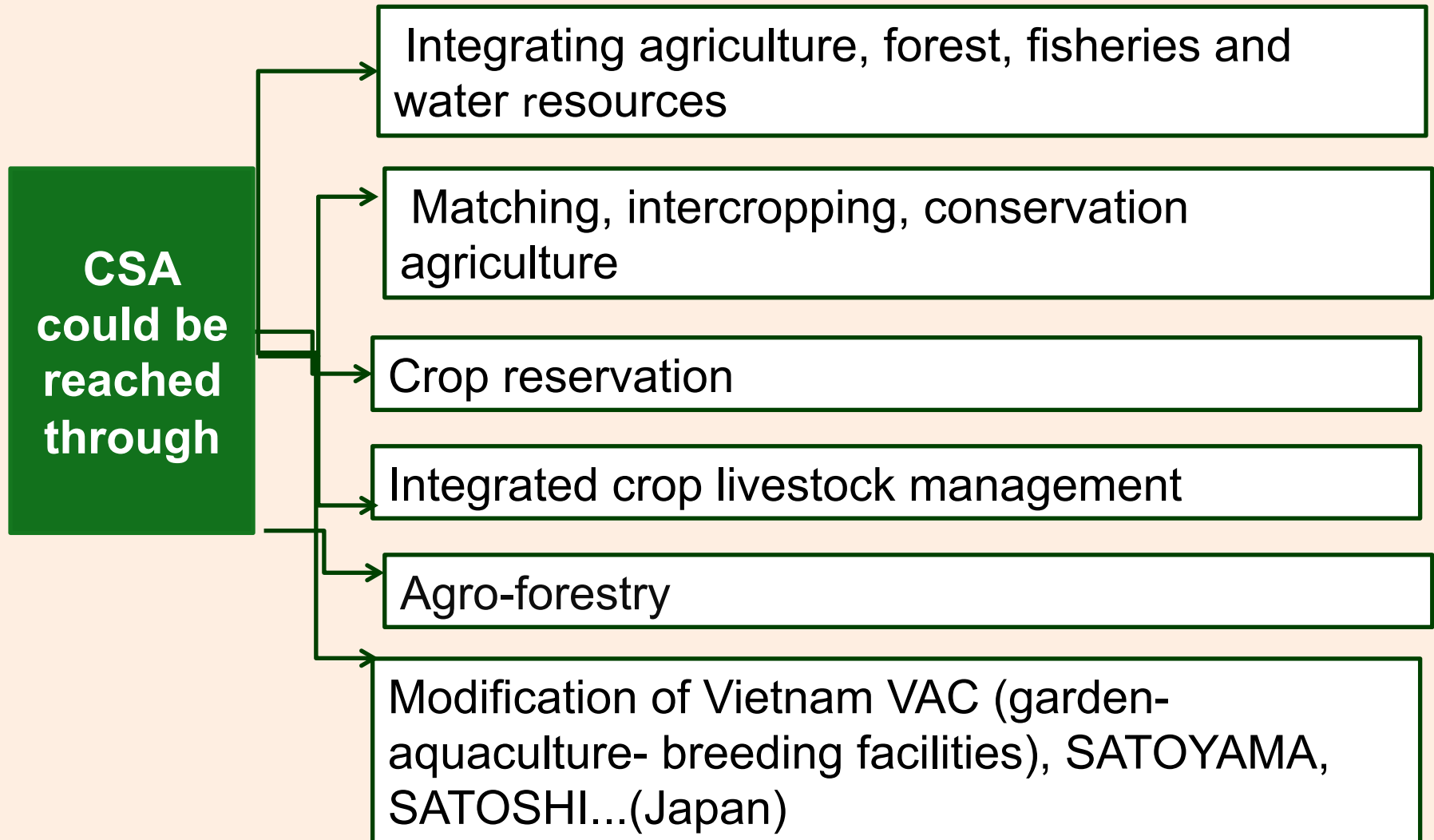
III. Response to Climate change for SD in Vietnam

3.8. Climate Smart Villages (CSV) for CCR and SD



III. Response to Climate change for SD in Vietnam

3.9. Climate Smart Agriculture (CSA) for CCR and SD



III. Response to Climate change for SD in Vietnam

3.10. Climate Smart Agriculture (CSA) for CCR and SD

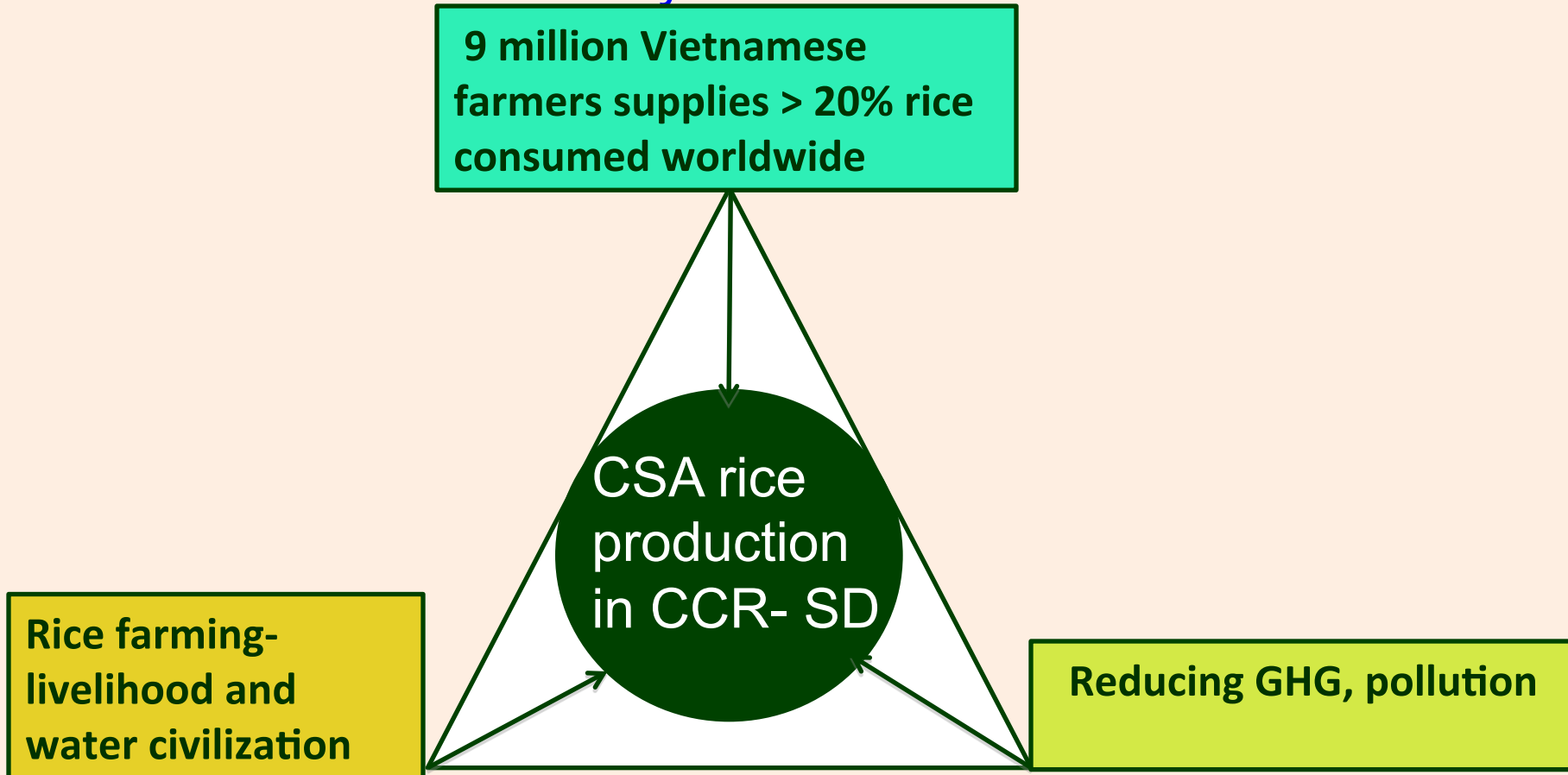
Vietnam rice production contributes to **world food security** and **local livelihood sustainability**

9 million Vietnamese farmers supplies > 20% rice consumed worldwide

CSA rice production in CCR- SD

Rice farming- livelihood and water civilization

Reducing GHG, pollution



III. Response to Climate change for SD in Vietnam

3.10. Climate Smart Agriculture (CSA) for CCR and SD

26.3 million ha of agriculture land (79.4% total area of Vietnam)

70% of the population living in rural and mountainous areas

Agriculture contributes 21% of GDP, expertes 10 billions uses 47% of the labor force

CSA in Vietnam

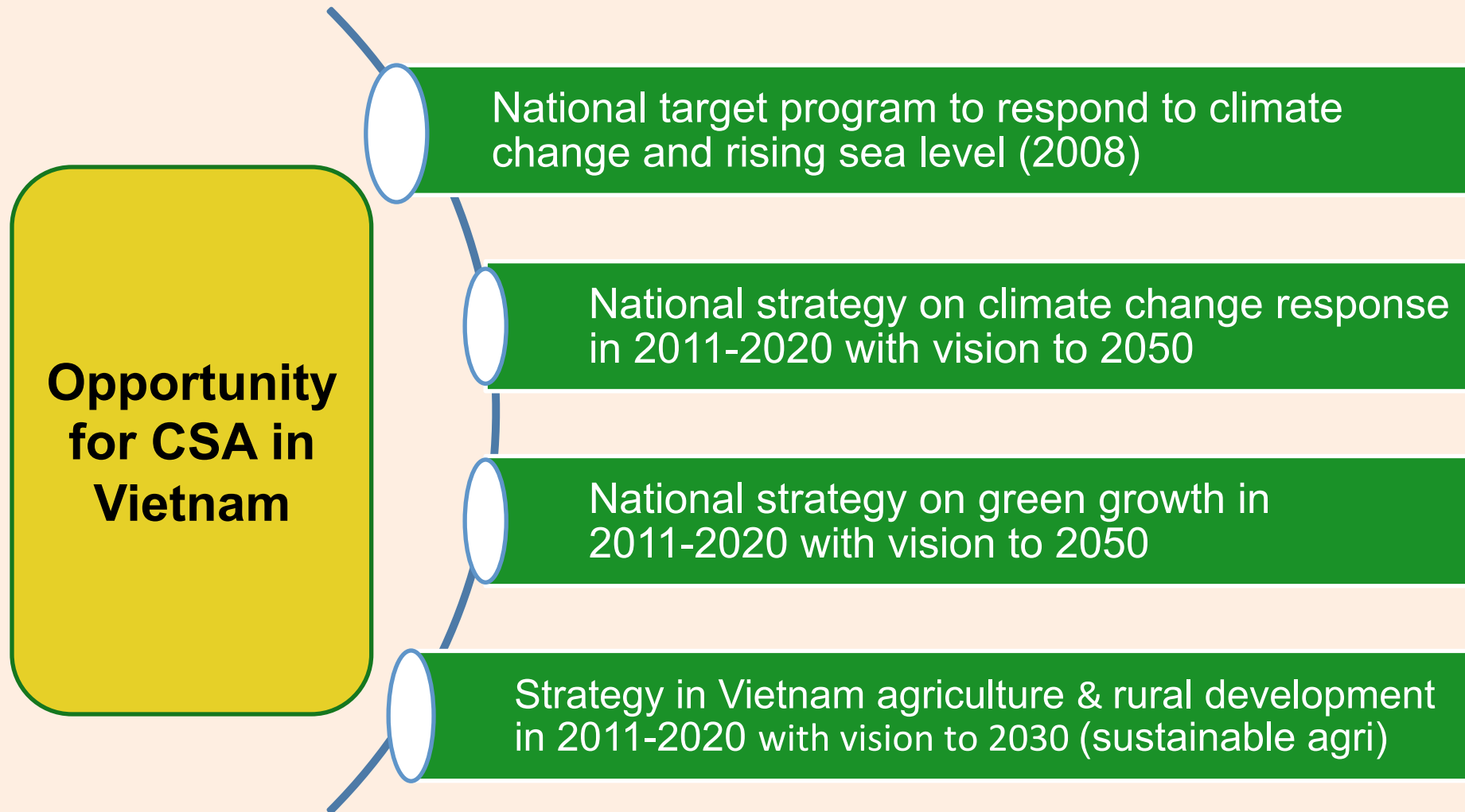
Agriculture depends strongly on climate conditions

In 2012, Vietnam expertes 7.7 millions tons of rice

Bad impacts of climate change on agriculture in 2012: 40,000 ha and 42,000 of agriproducts lost because of climate change

III. Response to Climate change for SD in Vietnam

3.10. Climate Smart Agriculture (CSA) for CCR and SD



III. Response to Climate change for SD in Vietnam

3.10. Climate Smart Agriculture (CSA) for CCR and SD

Increased investment for environment protection and climate change response for SD

Production-2nd rice exporter, food security, hunger reduction

Preventing soil erosion, protecting soil and soil moisture, 3R and agriculture waste energy

New, adaptive technology development and transfere, enhancing indegenious knowledge

Adaptive innovation policy, strategies

Private sector engaged more to invest and develop agriculture business

Achievements of Vietnam agriculture toward SD

III. Response to Climate change for SD in Vietnam

3.10. Climate Smart Agriculture (CSA) for CCR and SD

Sustainable Intensification of Rice Production (SRI)

1. Growing more rice in sustainable ways

2. **Less water** and agrochemicals used by alternate wetting and drying of soil (AWD), **less GHG emission**

3. Application of more organic fertilizers rather than synthetic ones

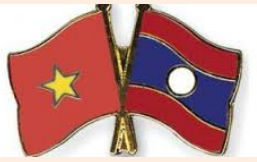
4. Widely spaced in a grid pattern

5. Integrated pest management



3E NEXUS implementation: Integrated Sustainable Development Model based on 3E+1

(Economics + Environment + Ecosystem + Non-traditional Security)
In the West and Northwest Areas of Vietnam



Objectives

General Objectives: establishing sustainable development models based on 3E +1 of **the West and Northwest areas of Vietnam** for:

- Socio-economic harmonious development;
- Natural resource sustainable use and management & environmental protection;
- Living standard of ethnic minority community improved;
- Non-traditional security ensuring;
- Proactive disaster and climate change response

Specific Objectives: to

- Determine scientific and practical basics of model 3E+1 in the study areas;
- Develop the model 3E+1 in accordance with characteristics of the study areas;
- Establish a GIS database on natural conditions, socio-economic, natural resources, environment and disasters in the study areas and main pilot sites;
- Propose measures to implement the model 3E + 1.



Approaches

Relationship between 3E + migration in the West and Northwest areas of Vietnam

ECOSYSTEM

*Quality and scale of ecosystem;
Decline in biodiversity;
Decline in ecosystem services*

ECONOMICS

*Livelihoods: based on extraction
and use of resource,
ecosystems, biodiversity;
Outdated methods of farming &
production;
Low income, poverty*

ENVIRONMENT

- *Living space, culture;*
- *Environmental quality;*
- *Impacts of natural disasters;*
- *Reduced resource provision.*

Environmental Migration in the West and Northwest areas of

- *Depletion, loss of livelihood;*
- *Loss of habitat and residence;*
- *Unsafe for living, working, and
producing.*

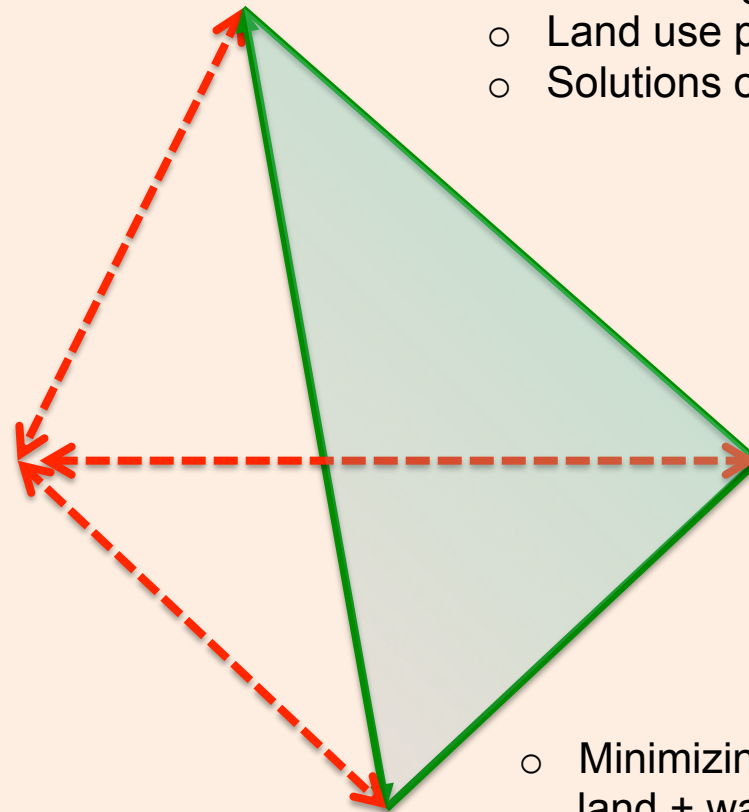


Approaches

Solutions for the Model 3E+1 Implementation

E –economy

- Sustainable livelihood patterns;
- Raise living standards and income
- Land use planning
- Solutions on policy and technique



E – ecosystem

- Forest Fire prevention
- Protecting natural ecosystems;
- Biodiversity conservation;
- Improving bio-productivity.

E - environment

- Minimizing environmental impacts of land + water;
- Ensure security of water resources
- Adaptation and mitigation of hazards, natural disasters and climate change

Environmental Migration
(Non-traditional Security)

- Migration due to declined livelihoods, degraded ecosystem & environment;
- Policy Solutions for population stabilization;
- Development cooperation between border areas with Laos.



Main Contents & Study Area

Main content:

- 1) **Establishing Model 3E+1:** relationship among Economic development, Ecosystem conservation, Environment protection (3E) in SD strategies in **the West and Northwest areas of Vietnam;**
- 2) **Non-traditional Security (+1):** environmental migration in **the study areas**

The Study area:

- 1) Communes/wards in border areas (BGQG Act, 2013);
- 2) Develop GIS database on Vietnam - Laos border areas: 90 border communes of Dien Bien, Son La, Thanh Hoa and Nghe An (NĐ 34/2014/NĐ-CP);
- 3) Establishing the integrated sustainable development model 3E + environmental migration: Chieng Khuong (Song Ma, Son La province); Bat Mot (Thuong Xuan, Thanh Hoa province); Na U (Dien Bien, Dien Bien province) (CT 14/2005 / CT-TTg).



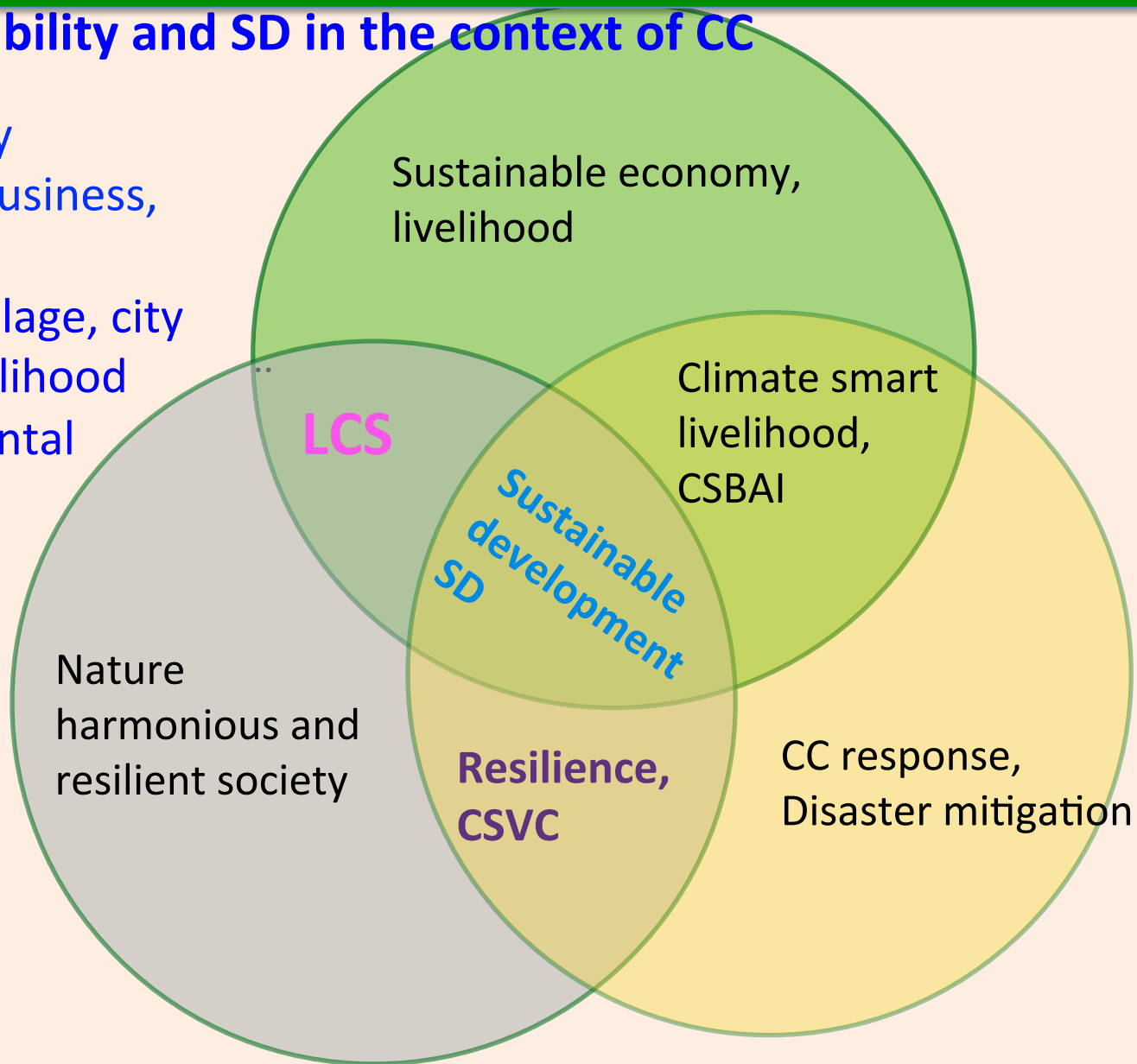
**IV. Perspectives of sustainable society
building for better climate change
response and sustainable
development**

Opportunities for building the sustainable society

Opportunities from Goals of sustainable development (GSD)

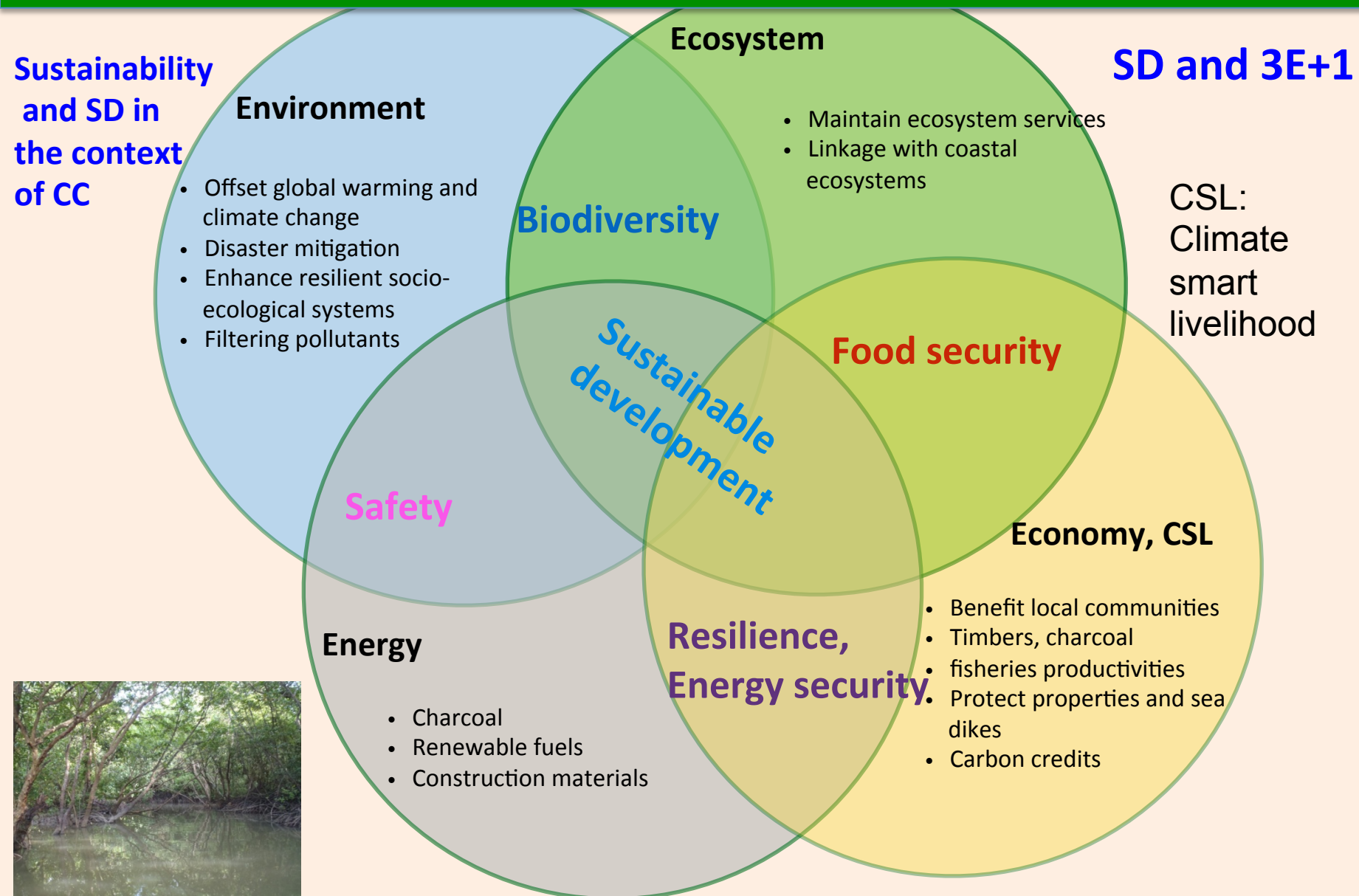
Maintaining sustainability and SD in the context of CC

- LCS: low carbon society
- CSBAI: climate smart business, agriculture, industry,
- CSVC: climate smart village, city
- CSL: Climate smart livelihood
- SED: sound environmental development



Opportunities for building the sustainable society

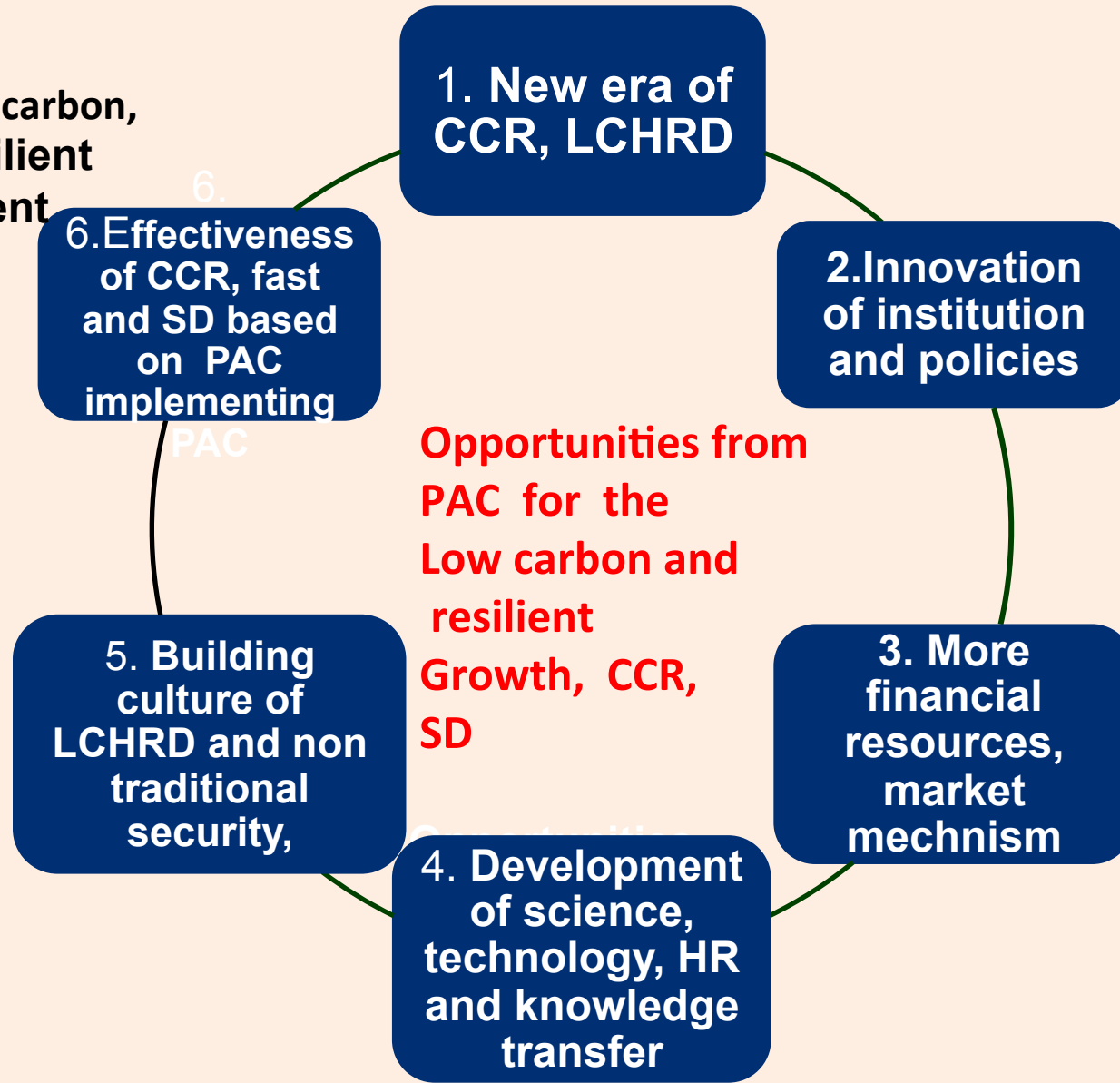
Opportunities from Goals of sustainable development (GSD)



Opportunities for building the sustainable society

Opportunities from Paris Agreement on Climate change (PAC)

LCHRD- low carbon,
Highly resilient
development

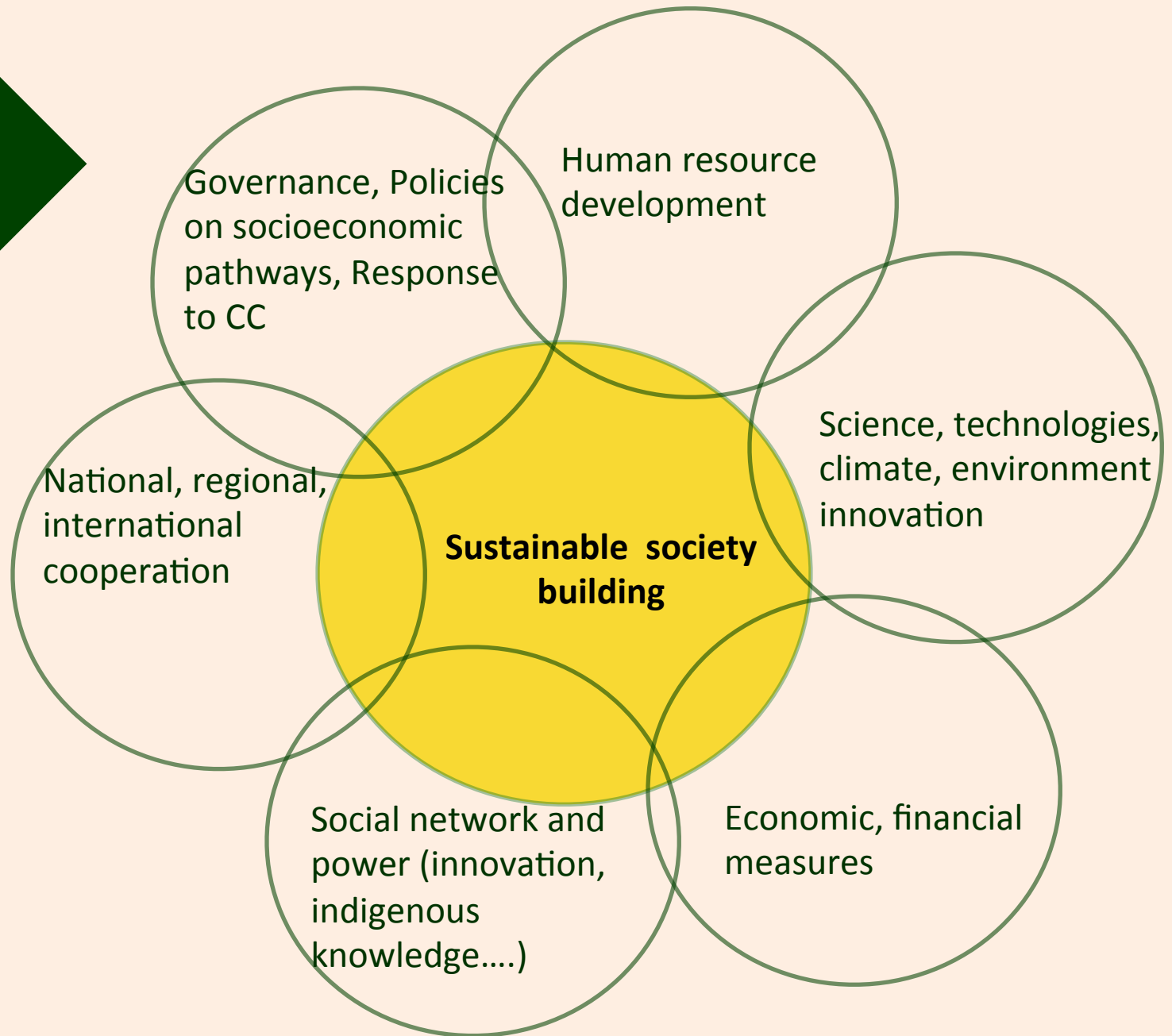


4.1. Sustainable society for CCR and SD

4.1. Objectives

- 3R production, Reducing GHG emissions (**3R Society**);
- Reduce impacts, loss by disasters and CC; increasing natural and social resilience (**Resilient society**);
- Sustainable development of economy and society; improve living quality, prosperous & safety (**Happy society**);
- Sustainable use of natural resources, biodiversity and vital ecosystem maintained (**Nature harmonious society**)
- Contributing to implementing the Global SDGs and Climate change response;
- Creating new model of integration of CCR- maintaining sustainability - Safe Prosperity of sustainable development in the context of global change


**CCR for
Sustainable
Development**



4. Sustainable society for CCR and SD

4.2. Contents

Transformation to new sustainable society is a major solution for faster and sustainable development in the climate change context, to use the opportunities and transform the challenges from PAC



1. Adjust the growth model towards the low carbon, highly resilient, efficient use of energy, natural resources based on the high quality of human resources, advanced science and technology, financial resources, adaptive policies and institutions

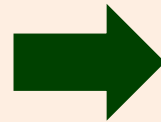
2. Build & develop sustainable society, appropriate with Vietnam conditions, contributing to implement objectives of sustainable development

4. Sustainable society CCR and SD

4.2. Contents

Make use of opportunities from PAC for transformation

Existing Development model based on natural resources and cheap labor force should be transformed into:



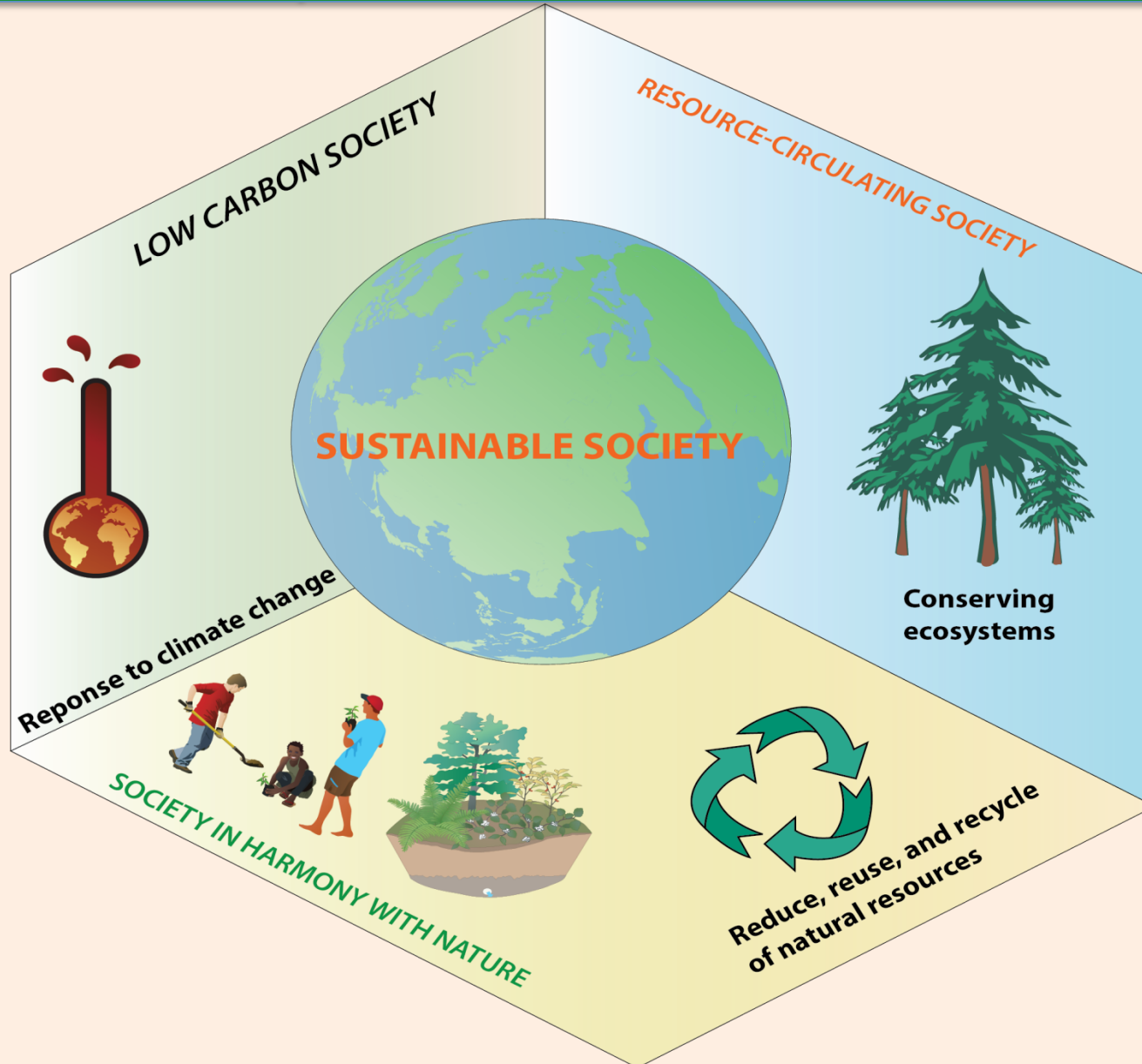
New Models of sustainable, low carbon, resilient development based on high quality HR, S & T, and smart governance

By promoting the resolution of Central Party and Government on proactive response to climate change, fostering natural resource management and other strategies

Fast economic growth & sustainable development

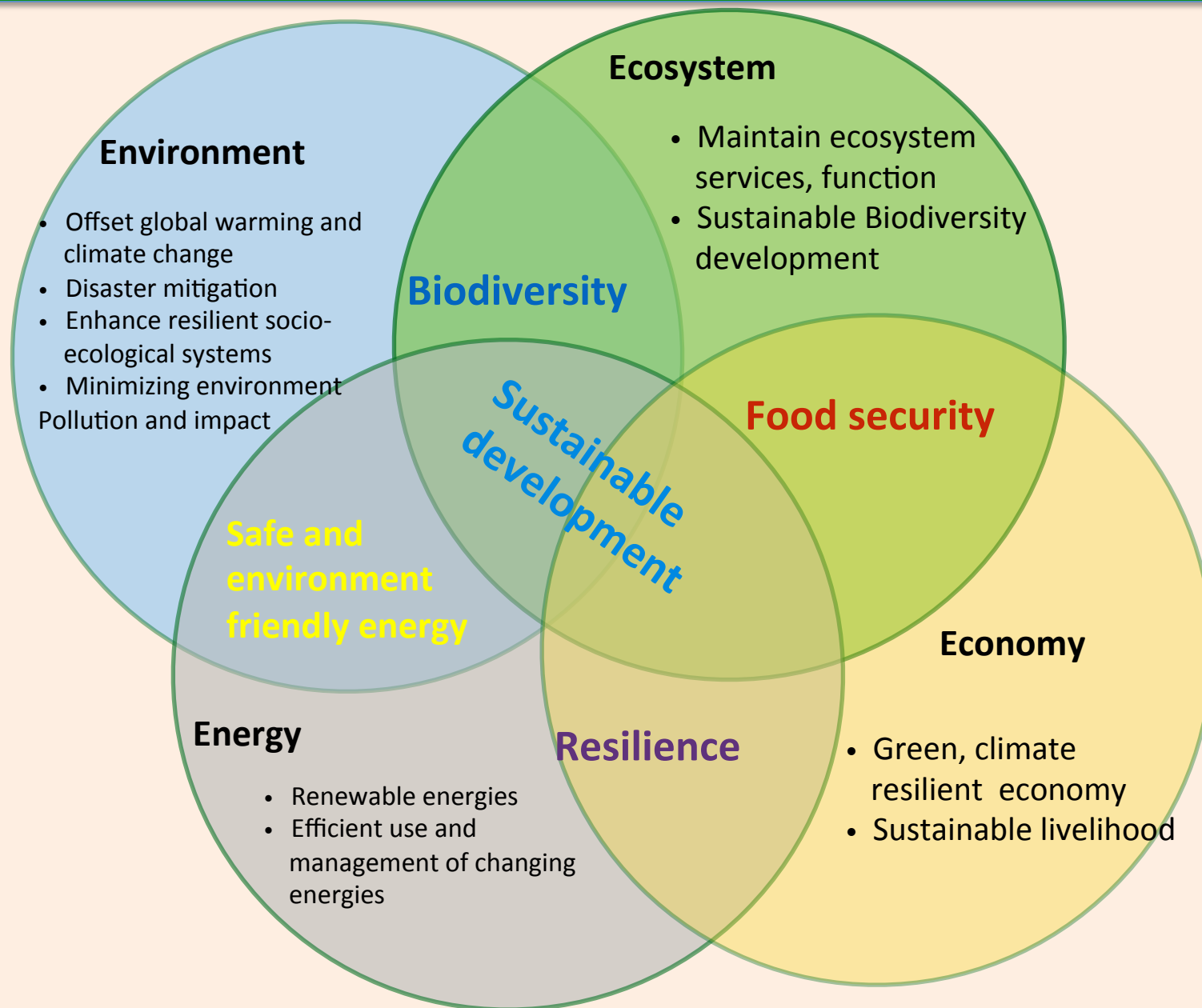
Sustainable society, development

Sustainable society:



4.1. New low carbon and resilient growth models for CCR and SD

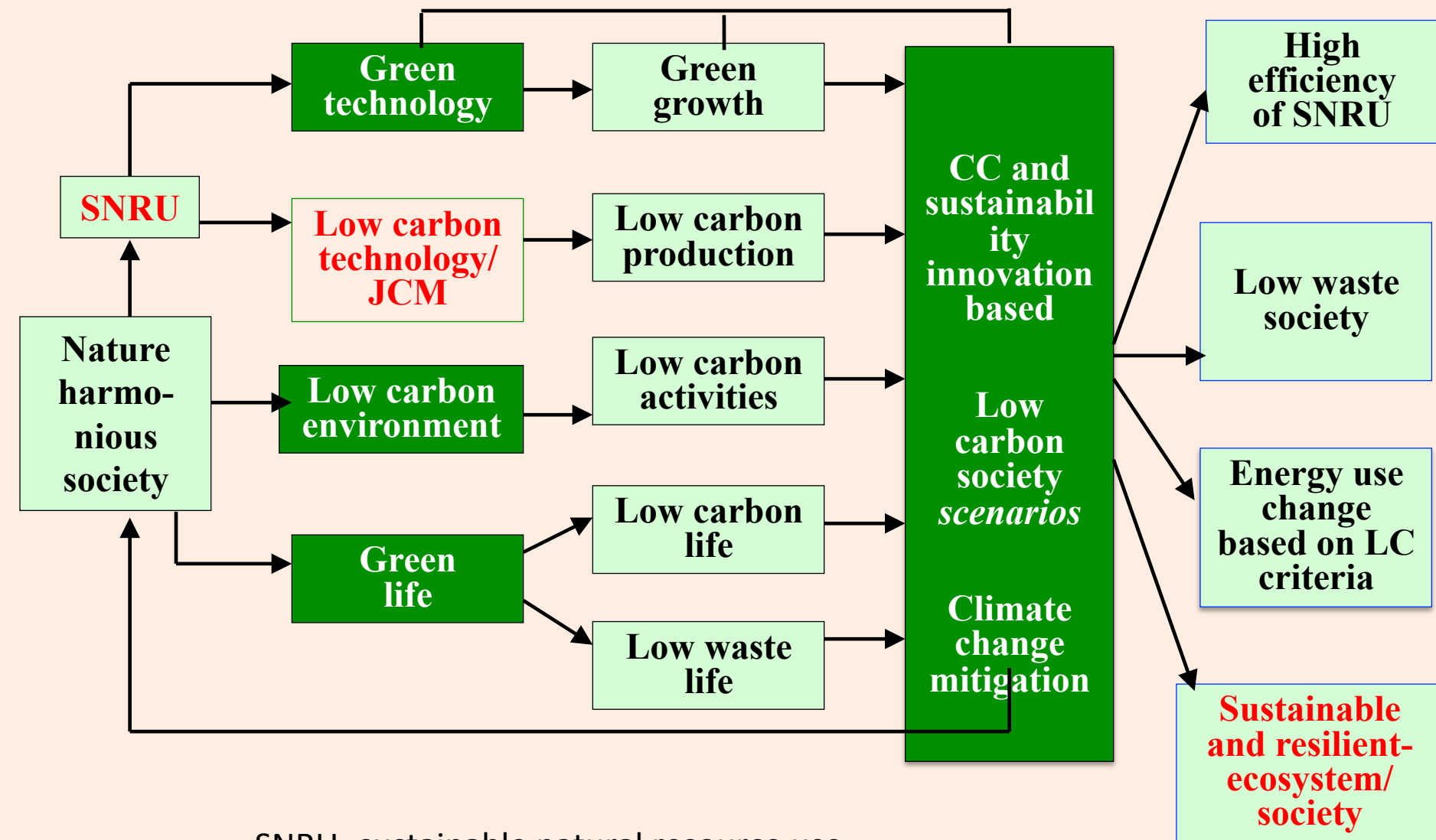
4.3. Measures: Implementing 3E+1 NEXUS Approach



4. Sustainable society for CCR and SD

4.3. Measures: Low carbon (LC) sustainable society building for CCR

SS framework: based on the innovative governance and policies



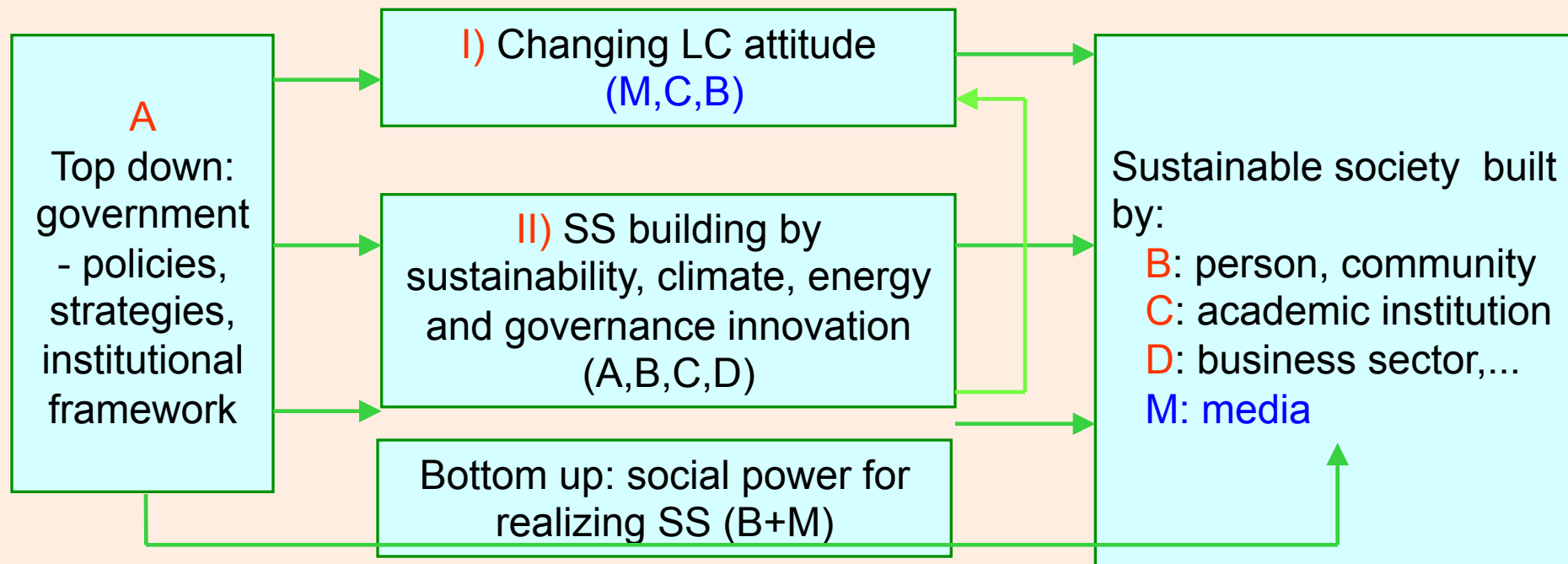
SNRU- sustainable natural resource use

JCM- Joint credit mechanism

4. Sustainable society for CCR and SD

4.3. Measures: Low carbon (LC) society building for SD

Sustainable society is built in two phases (I, II) by four players (A, B, C, D, M) and combination of bottom up and top down:



4. Sustainable society for CCR and SD

4.3. Measures: Low carbon (LC) society building for CCM

Sustainable society built through:

I) Policies and action plan in:

- Guarantee of stakeholder's benefit of LCS;
- Financial investment in sustainability, climate, energy and governance innovation for SS;
- Financial and social mechanism for sustainability, climate, energy and governance innovation, **new climate smart, sustainability smart, nature harmonious smart... models**

4. Sustainable society for CCR and SD

4.3. Measures: Low carbon (LC) society building for CCM

SS built through:

II) Transfer, incubation, start up, spin off sustainability, climate, energy and governance innovation, technology for SS:

2.1. Seed funding for startup, spin off commercializing

2.2. Space in hightech parks, universities, academic institutions

2.3. Consulting for start up, spin off,...

Sustainability Innovation Center, CIC (Climate Innovation Center)

2.4. Searching funds

2.5. Doing the innovations

4. Sustainable society for CCR and SD

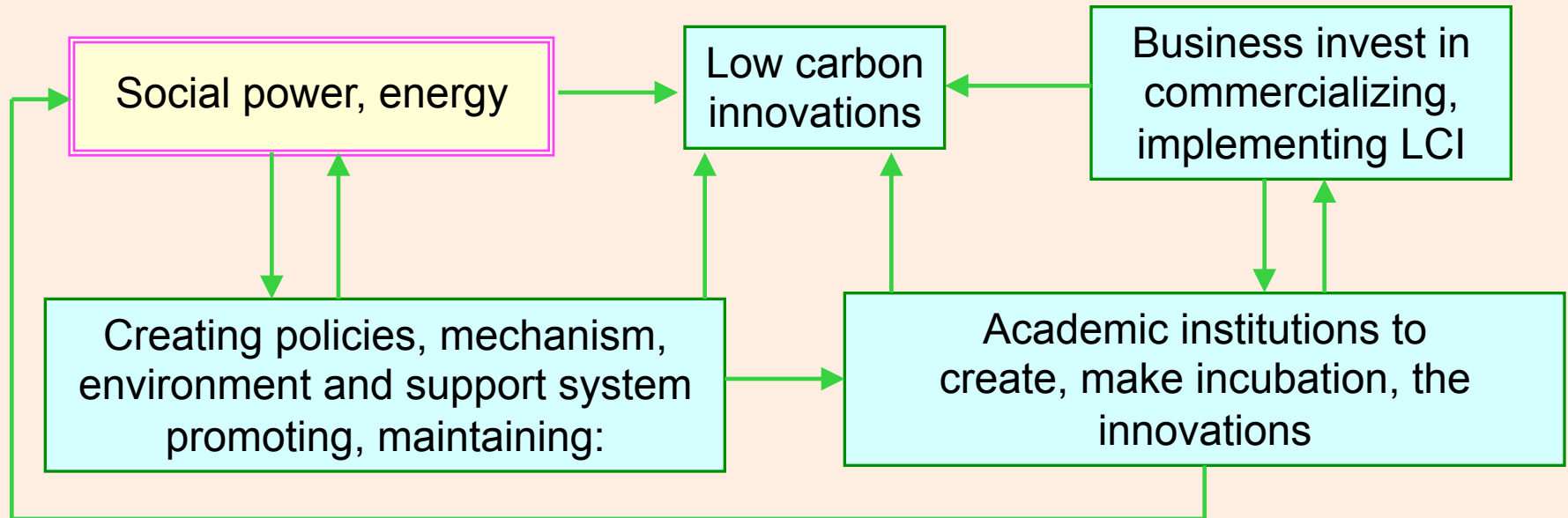
4.3. Measures: Low carbon (LC) society building for CCM

Sustainable society built through:

III) sustainability, climate, energy and governance innovation, technology implementing:

3.1. Community climate innovation (CCI)

Vietnam: bottom up



4. Sustainable society for CCR and SD

4.3. Measures: Low carbon (LC) society building for CCM

Sustainable society built through:

Top down approach for sustainable society :



Media: communicating all together and more...

V. Lessons learned

5.1. Effective CCR for SD should be based on the Point of view:

Institutional and policy innovations;
Based on S&T, policies, strategies,

Balance of benefits of stakeholders;
Strong leadership and social power

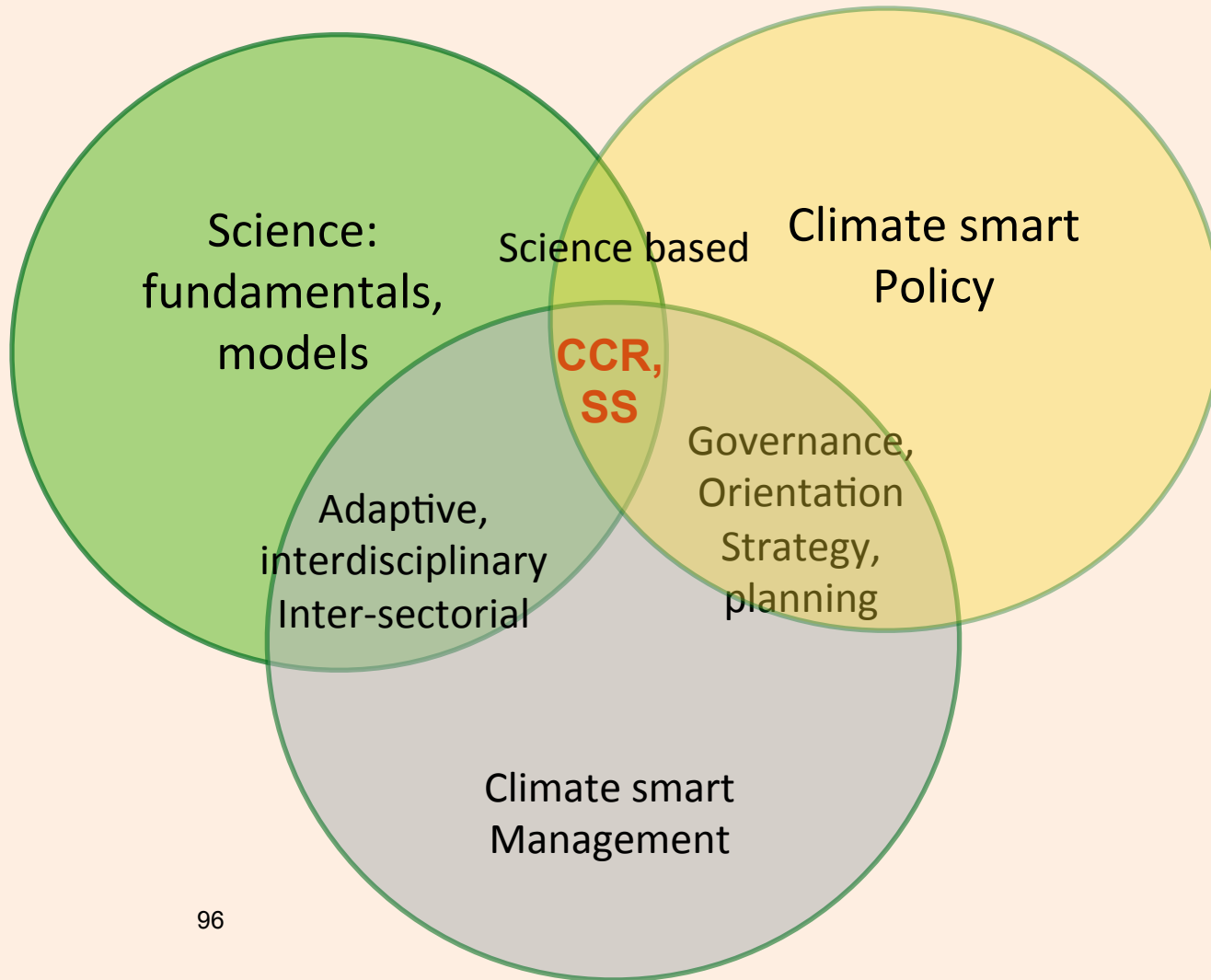
Integration, interdisciplinary, inter-sectorial
bottom-up, top-down approaches;

Integration of:
a) adaptation and mitigation
b) natural and social resilience
c) Reducing bad impact and transforming challenges into opportunities

Think globally, regionally, action locally
International effort and cooperation
Vietnam efforts

V. Lessons learned

Scientific, indigenous knowledge based climate smart governance



V. Lessons learned:

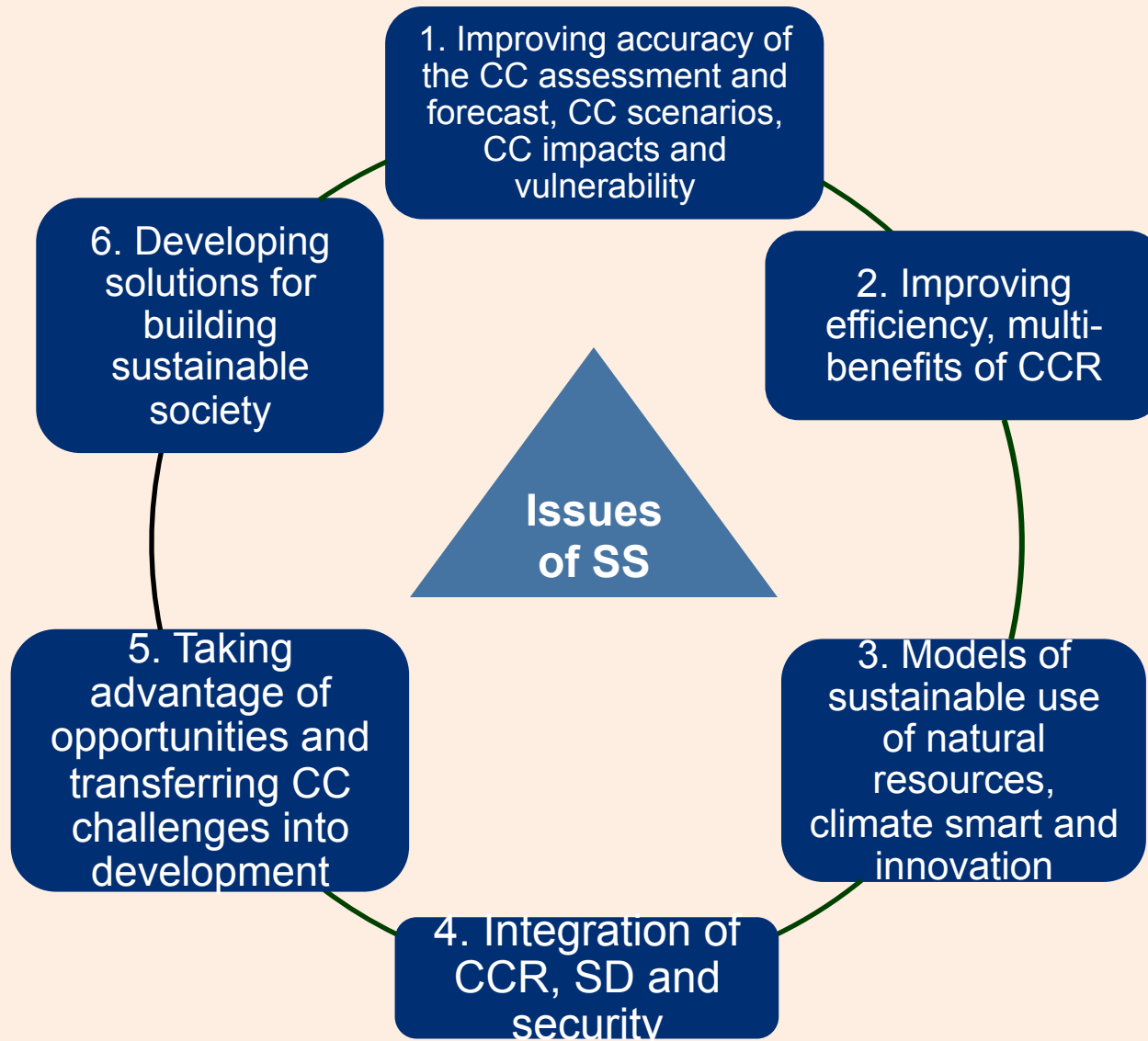
- Institutional and policy innovations: the First priority and in advance creating the platform, framework, directions, promotion, finding and using resources for CCR, SD, building sustainable society;
- Promoting integration of CCR and SD, CC adaptation and CC mitigation, sustainable livelihood and natural resource use, renewable energy development...;
- Social power and innovation, combination of traditional, indigenous knowledge and modern science and technology are very important for CCR, building sustainable society;
- Promoting new models of production based on sustainable natural resource use and (Satoyama, Satoumi, VAC), climate smart, LCS models, Energy innovation.

V. Lessons learned

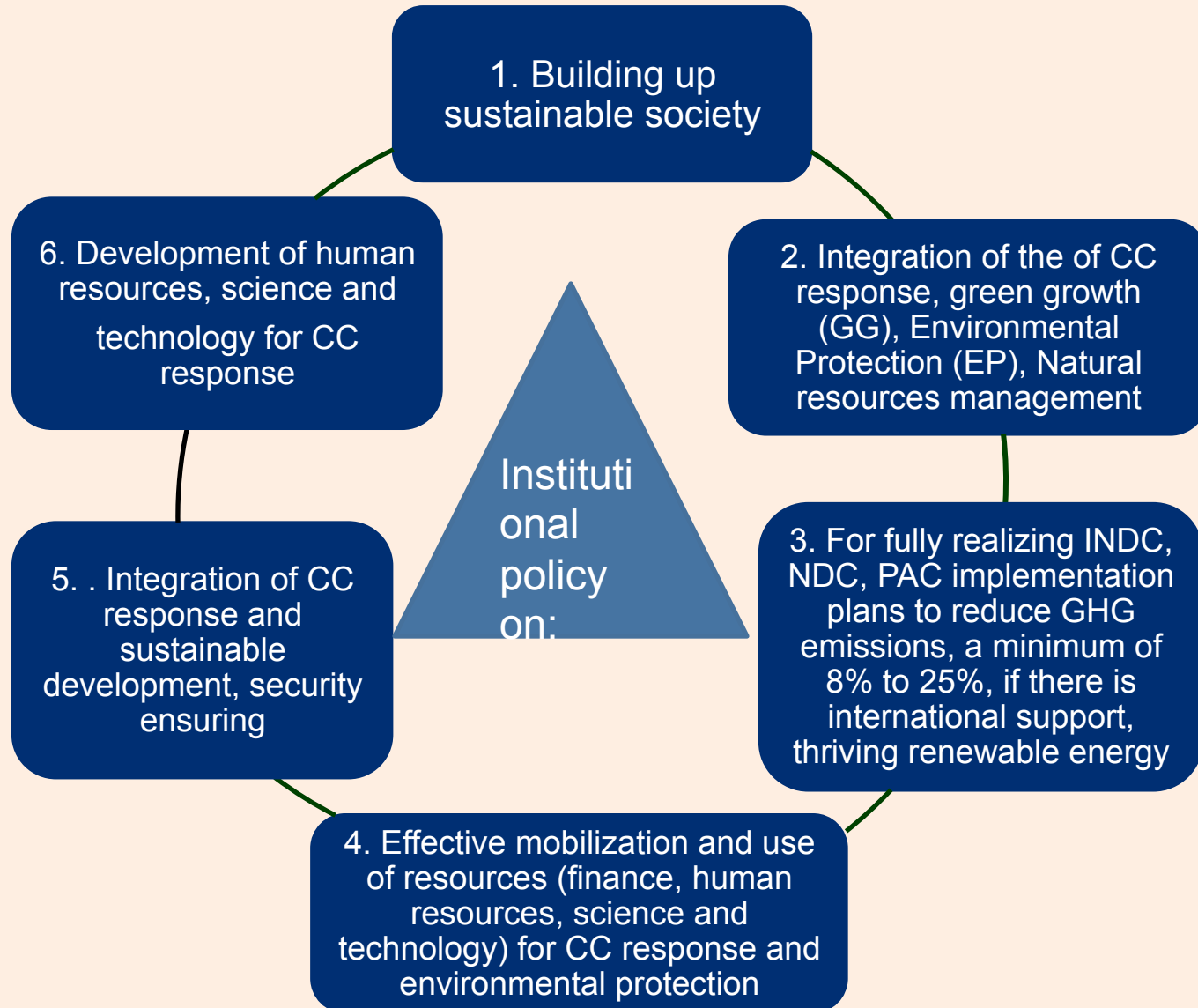
Needs to have the following conditions, solutions for building sustainable society

- ✓ **To change**
 - ✓ Mindset of communities, especially leaders, managers about the CCR for SD, building sustainable society ; considering climate change response is a smart business, dedication, safe and sustainable development of human being
- ✓ **To develop and enhance**
 - ✓ Efficiency of institutional, policy, governance for promoting sustainable society
 - ✓ Human resources, talents, science and technology for the sustainable development model, sustainable society, climate smart model, ...
- ✓ **To promote**
 - ✓ The higher social demands and benefits of CCR, SD, sustainable society
 - ✓ Climate innovation , sustainable development innovation
 - ✓ Financial mobilization
 - ✓ international cooperation and knowledge exchange

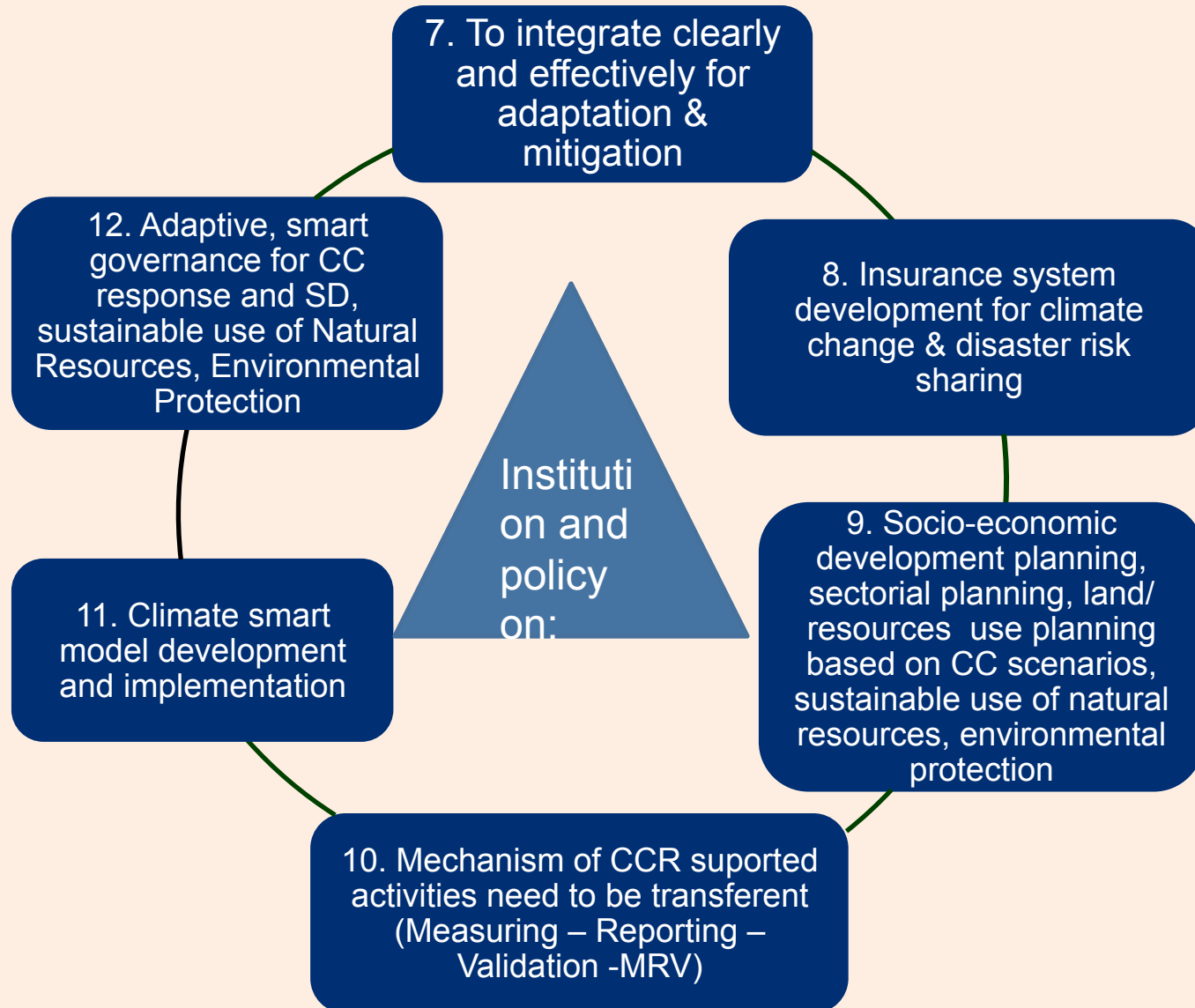
VI. Proposals for future cooperation: in science and technology



VI. Proposals for future cooperation: in policy and institution innovation



6. Proposals for future cooperation: in policy and institution innovation



Thank you for:

- Collaboration;
- Sharing;
- Trusting.