



Training on Climate Impact and Adaptation for Thailand

Thailand's National Development and Climate Change Adaptation

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Pattaya Marriott Resort and Spa, Thailand

Agenda

1. Climate Change Situations in Thailand

2. National Economic & Social Development Plan

3. Sustainable Development Goals

4. Climate Change Adaptation: Selected Sectors

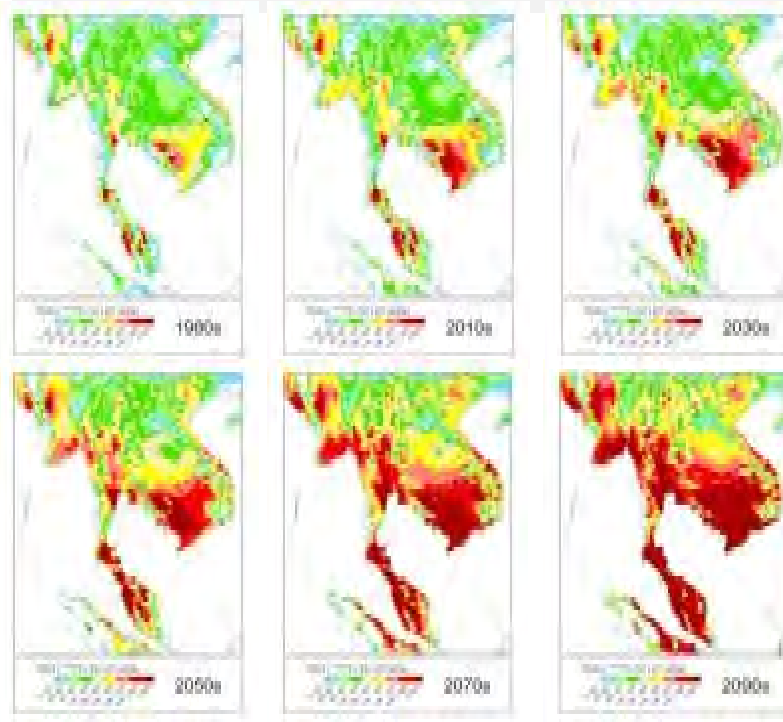
Climate Change Situations in Thailand

Climate Change Impacts and Greenhouse Gas Emission

Projected Climate Change

Temperature ↑

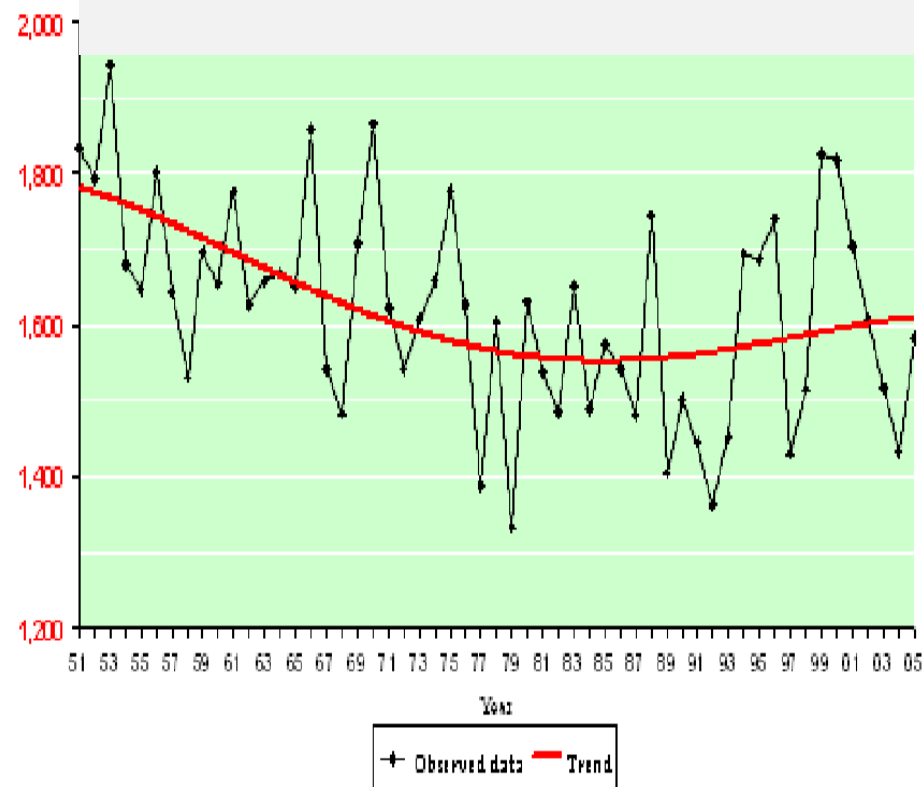
- Increasing temperature around 1°C
- Longer summer season around 2 – 4 weeks



Source: SEA START

Rainfall ↓

Decreasing annual rainfall in the next 20 years: Central Region, some part of the North Eastern Region



Climate Change Impacts on Coasts

Coastal Erosion ↑
Increasing and severe risk of coastal erosion

Central Region	Eastern Region	Southern Region
Samutprakarn	Chachoengsao	Ranong
Petchaburi	Chonburi	Phuket
Prajuabkirkhan	Rayong	Krabi
	Chantaburi	Trung
	Trad	

Source: SEA START



Impacts on Coastal Areas



20 Rising sea level
mm. per annum



66 Erosion > 1 meter
km. of coastlines



19 Residents in coastal
provinces
million people



10% Tourism in coastal areas
of GDP

**Economic and
population growth in
the coastal provinces
are higher than a
national average**

Climate Extreme Events

Ranking and Population Exposed to Disasters (76-0 /.)

Disaster	Population (head)	Ranking
Cyclone	5,147	52 From 89
Drought	2,440,010	31 From 184
Flood	819,822	7 From 162
Landslide	2,496	42 From 162
Earthquake	22,860	92 From 153
Tsunami	3,487	54 From 76

Bangkok was prone to flood risk and
Ranked 7 in terms of population from 20 countries
Ranked 10 in terms of asset value from 20 countries



Impacts from Climate Extreme Events

Urban infrastructure systems are disrupted by climate extreme events

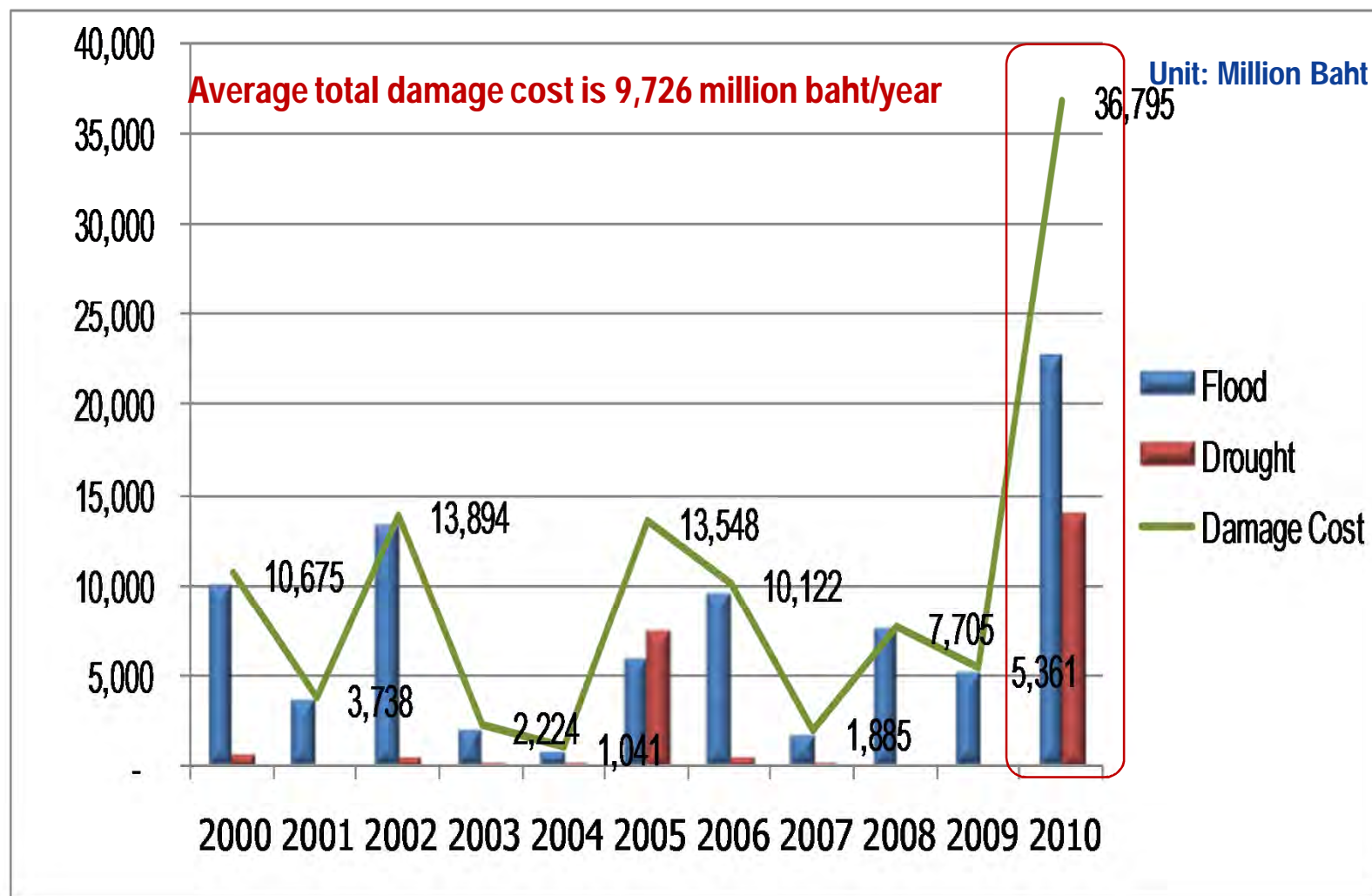
Roads and rails are destroyed by

- Coastal erosion
- Sea level rise
- Floods
- Landslide

Cascading system failures follow climate extreme events such as electricity, water supply, waste collection



Damage Costs from Climate Related Extreme Events



Source: Department of Disaster Prevention and Mitigation

Climate Related Events: Repeated Flood

8-10 times in a decade cycle in Sukothai, Pichit, Nakornsawan, Nongkai, Kalasin, Loie, and Yasothorn Provinces.

4-7 times in a decade cycle in Chiengrai, Payao, Kon-kan, Mahasarakam, Srisaket, Ubonratchatani, Nakornsri-thammarat, Patalung, Pattani, Yala , Narathiwat Provinces.

Not exceeding 3 times in a decade in **Chiengrai, Payao, Konkan, Mahasarakam, Srisaket, Ubonratchatani, Nakornsri- thammarat, Patalung, Pattani, Yala, Narathiwat Provinces.**



Impacts on Economic Sectors & Ecosystem

40% In agriculture sector
25 Million people
of total population

**High dependency on natural climate.
Heavily impacts by**

- Changes in precipitation patterns
- Greater intensity & frequency of extreme weather



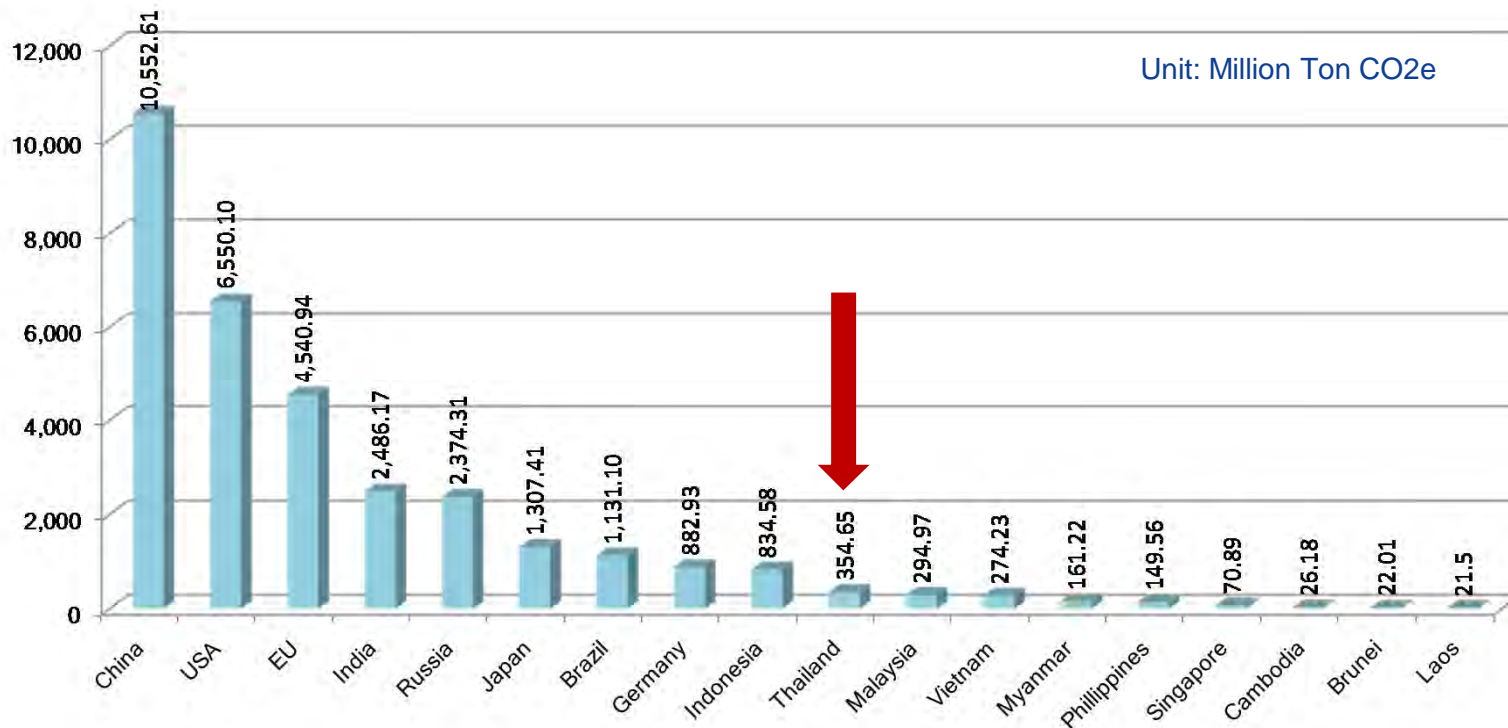
1.5-2.5 Temperature rise
degree Celsius



20-30% Biodiversity loss
of current biodiversity level

Thailand's Greenhouse Gas Emissions

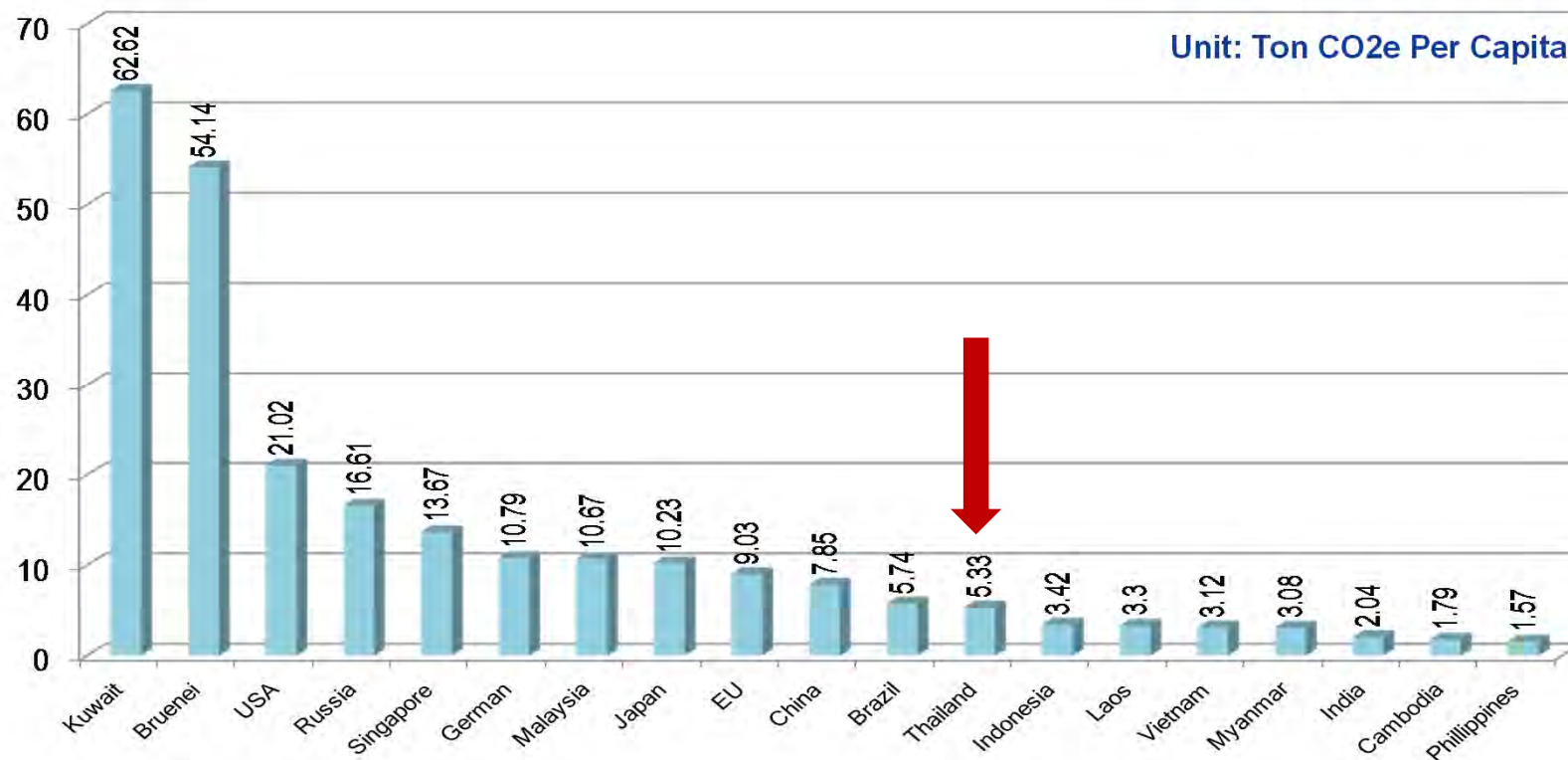
In 2011, Thailand contributed **0.81 % of world Total GHG Emission** and ranked **24th** in the world.



Source: World Resource Institute (2011)

Thailand's Greenhouse Gas Emissions

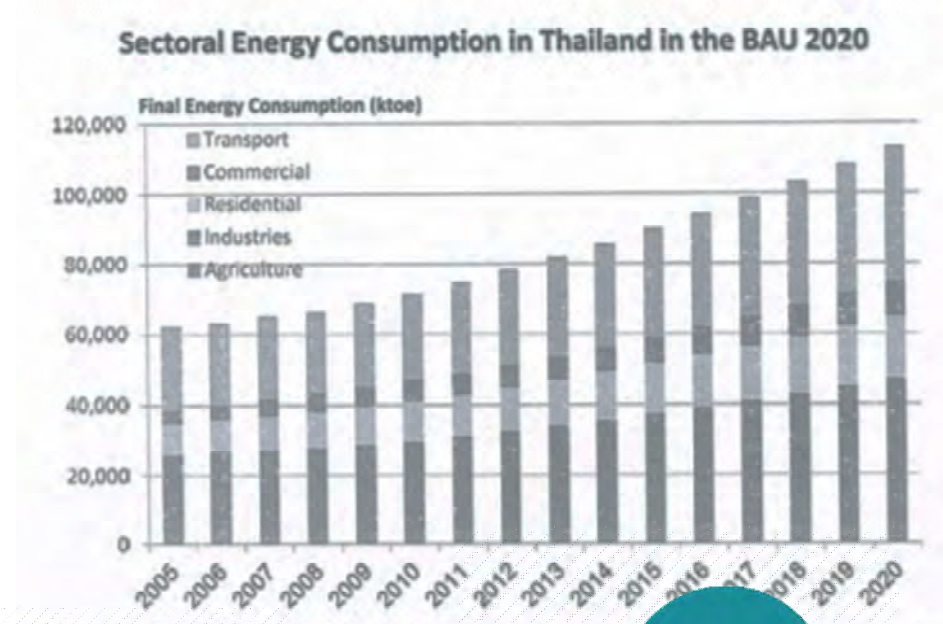
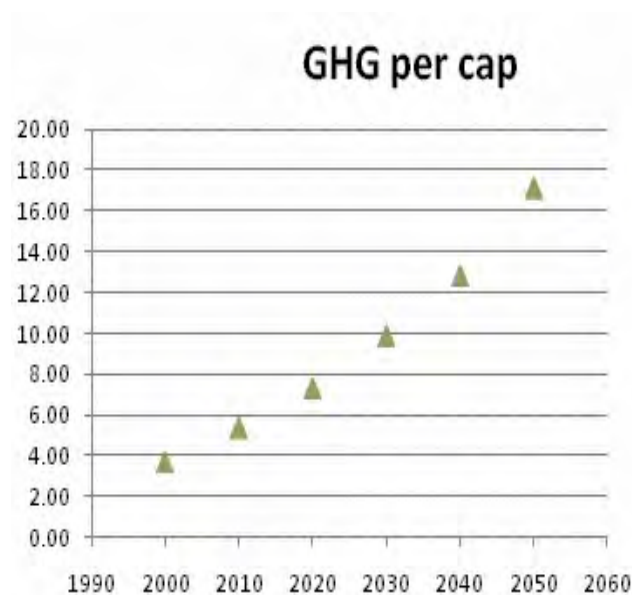
In 2011, Thailand's **GHG Per Capita** was **5.33 Ton CO₂e** and ranked **93rd** in the world.



Source: World Resource Institute (2011)

Thailand Projection of GHG Emission Per Capita

**Future emissions of GHG will increase
as economic growth, energy use and population increase.**



5.3
Tons GHG/capita
Yr 2011



10.0
Tons GHG/capita
Yr 2030



18
Tons GHG/capita
Yr 2050



Thailand's GHG Emission by Sectors

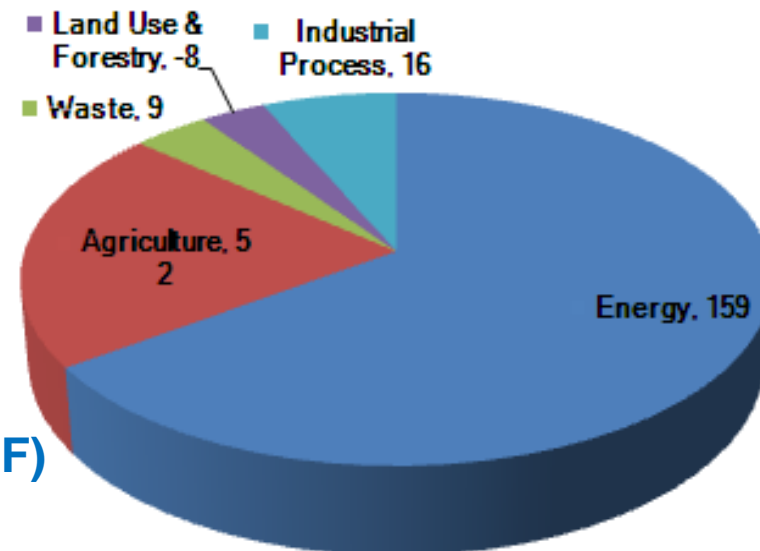
Total GHG Emission by Sectors
in 2000



Energy sector was the major contributor with the largest share of GHG emission



Land use & forestry (LULUCF) was the only sector that absorbed GHG.



Unit: Million Ton CO₂e

Source: The Second National Communication (2010)

Integration of Climate Change into Policies & Plans



The National Economic and Social Development Plan



Master Plan on Climate Change (2013-2050)



Alternative Energy Development Plan (AEDP) (2012-2021)



Environmental Quality Promotion Plan (2012-2016)



20-Year Energy Conservation Plan (2011-2030)



Agricultural Climate Change Strategy and Action Plan



Power Development Plan (PDP) (2010-2030)



Industrial Development Master Plan



Master Plan on Sustainable Transportation and Climate Change Mitigation (2013-2030)



National Policy and Plan on S&T and Innovation (2012-2021)

National Economic & Social Development Plan

Mainstreaming Climate Change and Disaster Risk
Reduction into the Plan

The 11th NESD Plan (2012-2016)

VISION :



"A happy society with equality, fairness and resilience"

TARGETS :



NESD =
National
Economic
& Social
Development

- **Thai society will become a better place**, characterized by harmony and the well-being of its people, where inequality is decreased, the number of people beneath the poverty line is reduced.
- **All citizens will acquire lifelong learning opportunities and better health**, while social institutions are strengthened.
- **The Thai economy is expected to provide inclusive growth at a moderate pace based on its potential** by upgrading total factor productivity (TFP) to at least 3 percent per annum, by improving Thailand's competitiveness rank, and by increasing the contribution of SME's to at least 40 percent of GDP.
- **Environmental quality will be improved to meet international standards**, reduction of green house gas emissions will be more efficient, and forest areas will be expanded to restore balance to the ecology.

The 11th NESD Plan



Creation of **Quality Human Capital** and **Society**

Strategy 1: Create Justice in Society

Strategy 2: Build Learning Society

Economic Restructuring

Strategy 3: Strengthen Agriculture Sector and Food & Energy Security

Strategy 4: Restructure Economy towards Quality Growth and Sustainability

Strategy 5: Connect Regions

Management of **Natural Resources**

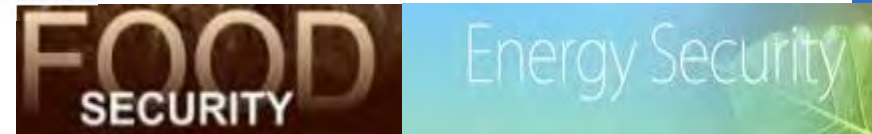
Strategy 6: Prepare for the Transition to Low-carbon Society and Climate Change Impacts

The 11th NESD Plan

ECONOMIC RESTRUCTURING

Strengthening agriculture and food & energy security

- Reinforce natural resources as the foundation of agricultural production
- Increase agricultural productivity
- Add value of agricultural commodities along supply chains
- Enhance food security and develop bio-energy at household and community levels



Restructuring trade & investment

- Enhance competitiveness by creating more free & fair environment
- Expand investment abroad
- Support the quality growth of SMEs

The 11th NESD Plan

NATURAL RESOURCE AND ENVIRONMENT MANAGEMENT

Shift development paradigm towards Green growth



**Conserve and secure
natural resource and
environmental bases**



**Transition to low-
carbon & resilient
economy**

Minimize environmental impacts from industrial activities



**Foster resilience toward trade
measures associated with
environmental conditions and
climate change impacts**



**Reduce &
Control
pollutions**

The 11th NESD Plan

NATURAL RESOURCE AND ENVIRONMENT MANAGEMENT

Upgrade climate change adaptive capacity

- Ensure readiness for response to natural disaster
- Enhance Thailand's role in international arenas on environmental framework agreements

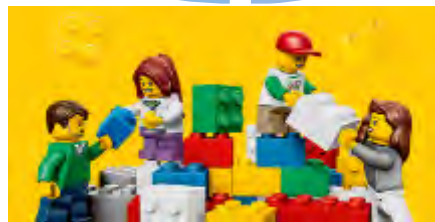
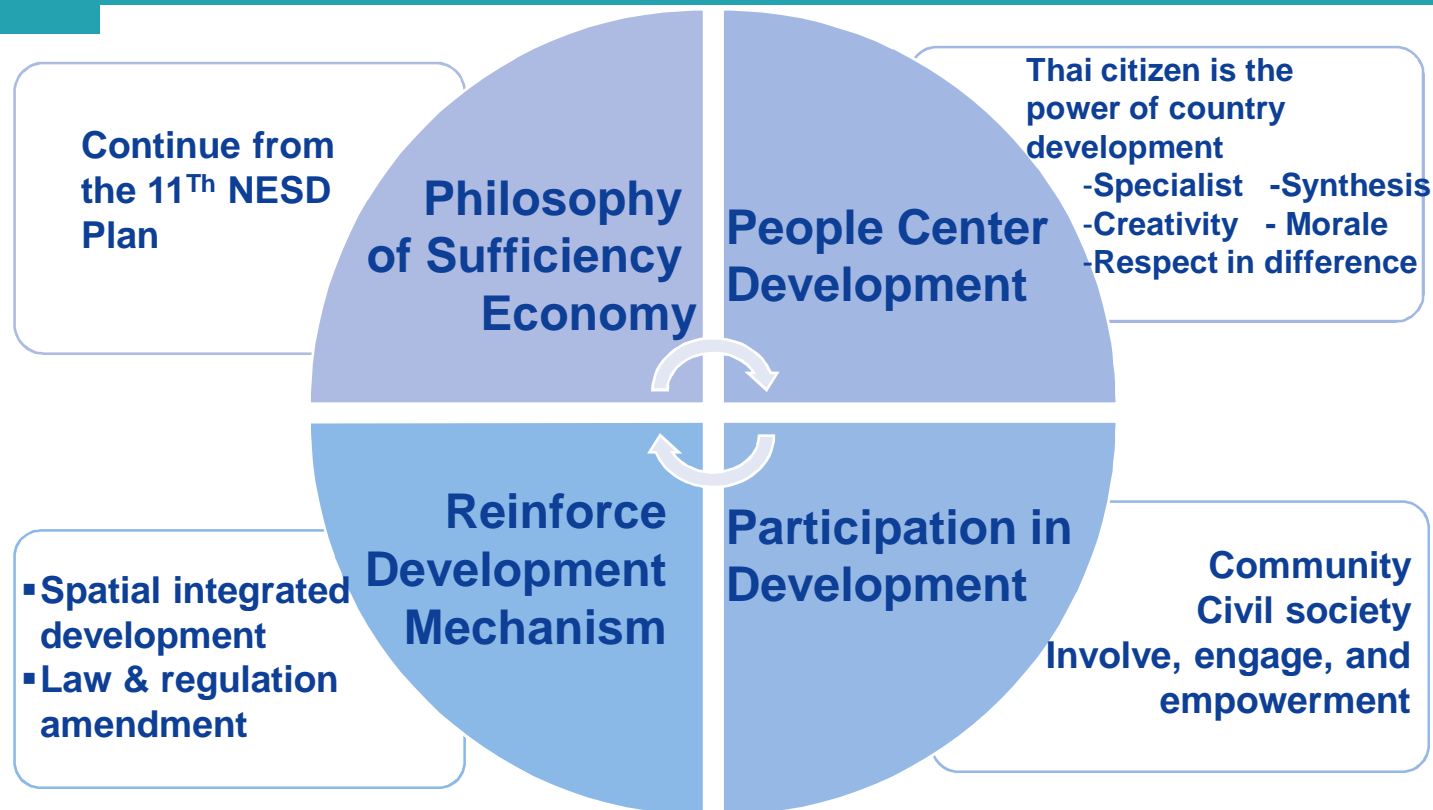


Sustainable management of water resources

- Develop GIS database & knowledge management
- Accelerate the adoption of Integrated Water Resource Management
- Formulate the master plan of water infrastructure for consumption and production



Framework of the 12th NESD Plan



**Adjust foundation to leverage
development**

Framework of the 12th NESD Plan



Fostering and Developing Human Resource Potential

Human development at all stages to nurture Thai to be decent, competent and disciplined with good quality of life. Special attention on senior citizens, which continuously increases in aging society, in the area of appropriate job creation, and health care



Building Justice and Reducing Inequality in Society

Focus on inequality reduction in all aspects to cultivate harmony in society. Create opportunity for all in society to be able to access natural resources and funds for job. This will result in better income and driving grassroots economy business



Strengthening Sustainable Economic and Competitiveness

Emphasis on transforming economy towards high income country. Restructure economy towards industry and services, where high technology and innovation are required. Improve competitiveness along the value chain of agriculture, industry and services. Support SMEs and new generation farmers. Formulate financial and fiscal policies and reform tax systems to create stability and increase efficiency of the economy.

Framework of the 12th NESD Plan



Achieving Green Growth for Sustainable Development

Achieve Green Growth, brining the balance of development in economic, social and environment. Develop country towards sustainability in the future, focusing on income generation, social cohesion, and healthy ecosystem. Secure the foundation of natural resource and environment by conservation and restoration. Create the balance between conservation and sustainable utilization. Manage water resource efficiently.



Establishing Security

Focus on security that affects all dimensions of development including economic, social, environment, and other potentials.



Enhancing Efficiency and Governance in Public Sector

Create good governance of public sector to be transparent, efficient, responsible, and accountable. Ensure public participation. Eliminate corruption. Continue decentralization of authority and mandates to regional and local governments

Strategies for
Low-Carbon & Resilient Society

Framework of the 12th NESD Plan



Developing Infrastructure and Logistics

Focus on development and management of transportation and telecommunication infrastructure . Support development of Special Economic Zone and urban areas. Connect international travel route and logistics



Science, Technology and Innovation

Continue, from the 11th Plan, the **support of science, technology and innovation**. Increase in R&D investment and improving the environment of scientific development



Developing Regions, Cities, and Economic Zones

Develop regions, cities, and economic zones in according with the direction of country development, potential, opportunity, limitation and needs of stakeholders. Build new economic foundation to be ready for AEC



Building Relations at Neighboring, Regional and International Levels

Coordinate and collaborate with other countries in proactive, reactive, and creative manners by focusing on commitments of global, regional, and sub-regional multilateral agreements in which Thailand is a member.

Strategies for Low-Carbon & Resilient Society

Strategy

Achieving Green Growth for Sustainable Development

- 1** **Conserve** natural capital stocks **for green growth**
- 2** **Manage** water resources **to achieve balance and sustainability**
- 3** **Solve for critical** environmental problems
- 4** **Set up** management **system &** conflict resolution **mechanisms**
- 5** **Promote** sustainable consumption and production
- 6** **Increase potential in** greenhouse gas reduction **and enhance adaptive capacity in** climate change adaptation
- 7** **Manage** disaster risk reduction
- 8** **Create** international environmental partnership

Achieving Green Growth for Sustainable Development



Conserve natural capital stocks for green growth

- 1) Conserve and restore forest resource**
- 2) Conserve and utilize biodiversity sustainably**
- 3) Set up land management system and solve for public land encroachment**
- 4) Protect marine and coastal resources**
- 5) Formulate a management plan for mineral resource**



Manage water resources to achieve balance and sustainability

- 1) Support the development of integrated water resources mgt master plan in 25 basins**
- 2) Improve efficiency of the entire water management system sustainably**
- 3) Ensure the water security and equity for consumption and production**
- 4) Use the Strategic Environmental Assessment (SEA) to ensure the suitability of the basin development scheme**
- 5) Raise awareness on importance of water resource**

Achieving Green Growth for Sustainable Development



Promote sustainable consumption & production

- 1) **Promote green industrial production and investment**
- 2) **Support agricultural production towards sustainable agriculture**
- 3) **Promote income generation from sustainable tourism**
- 4) **Catalyze consumers to change behaviors towards sustainable consumption pattern**



Solve for critical environmental problems

- 1) **Accelerate management of solid waste with appropriate technology, focusing on the crisis areas with high waste accumulation. Manage solid waste at the origin, reduce generation, increase separation for reuse and recycle.**
- 2) **Increase efficiency in water quality management. Reduce wastewater from origin. Develop and improve efficiency of community wastewater collection and treatment**
- 3) **Increase efficiency in air quality management. Reduce and control pollution to comply with the standard of industry & transport source. Speed up the solution of Transboundary haze problem**

Achieving Green Growth for Sustainable Development



Develop management system & resolution mechanism for natural resource and environmental conflicts

- 1) Improve Environmental Impact Assessment (EIA) mechanism to be more efficient in all steps**
- 2) Push forward the use of Strategic Environmental Assessment (SEA) as a tool in decision making of key policy issues**
- 3) Enhance public participation process in policy making**
- 4) Foster the roles of private and community to create synergy in protecting and restoring natural resource and environment**



Increase potential in greenhouse gas reduction and enhance capacity in climate change adaptation

- 1) Determine direction of low-carbon development strategy**
- 2) Draft the new laws and amend the existing laws relating to climate change**
- 3) Formulate measures and mechanisms to support GHG emission reduction**
- 4) Enhance capacity for adapting to climate change impact**
- 5) Build up knowledge, understanding, awareness, and participation of people and other stakeholders**

Achieving Green Growth for Sustainable Development



Manage disaster risk reduction

- 1) Mainstream disaster risk reduction to planning process at all levels**
- 2) Raise capacity in disaster preparedness and response**
- 3) Set up disaster management system for emergency response**
- 4) Establish system of restoration & recovery after disaster incidents**



Create international environmental partnership

- 1) Promote the formulation of natural resource and environmental management plan of ASEAN**
- 2) Seek for collaboration within ASEAN and Mekong Sub-Region on trans-boundary logistics, labor movement, energy and haze management.**
- 3) Create understanding and right practices on rules, regulations, and international agreements**

Sustainable Development Goals

Thailand's Initiative in SDGs

Sustainable Development Goals

“The sustainable development goals (SDGs)” are a new, universal set of goals, targets and indicators that UN member states will be expected to use to frame their agendas and political policies over the next 15 years.

GOAL 1 END POVERTY

GOAL 2 END HUNGER

GOAL 3 WELL-BEING

GOAL 4 QUALITY EDUCATION

GOAL 5 GENDER EQUALITY

GOAL 6 WATER AND SANITATION FOR ALL

GOAL 7 AFFORDABLE AND SUSTAINABLE ENERGY

GOAL 8 DECENT WORK FOR ALL

GOAL 9 TECHNOLOGY TO BENEFIT ALL

GOAL 10 REDUCE INEQUALITY

GOAL 11 SAFE CITIES AND COMMUNITIES

GOAL 12 RESPONSIBLE CONSUMPTION BY ALL

GOAL 13 STOP CLIMATE CHANGE

GOAL 14 PROTECT THE OCEAN

GOAL 15 TAKE CARE OF THE EARTH

GOAL 16 LIVE IN PEACE

GOAL 17 MECHANISMS AND PARTNERSHIPS TO REACH THE GOALS



Source: <http://lusaka.sites.unicnetwork.org/the-sustainable-development-goals/>

Sustainable Development Goals



End poverty in all forms everywhere



End hunger, achieve food security and improved nutrition and promote sustainable agriculture



Ensure healthy lives and promote well-being for all at all ages



Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all



Achieve gender equality and empower all women and girls



Ensure availability and sustainability management of water and sanitation for all

Sustainable Development Goals



Ensure access to affordable, reliable, sustainable and modern energy for all



Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all



Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation



Reduce inequality within and among countries



Make cities and human settlements inclusive, safe, resilient and sustainable



Ensure sustainable consumption and production patterns

Sustainable Development Goals



Take urgent action to combat climate change and its impacts



Conserve and sustainably use the oceans, seas and marine resources for sustainable development



Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation and halt biodiversity loss



Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all level



Strengthen the means of implementation and revitalize the global partnership for sustainable development

Keys Success Factors of SDGs



- ❑ **Sustainable Development** is an agenda of action for **People**, **Planet** and **Prosperity**.
- ❑ **SD** is also seek to strengthen universal **Peace** in larger freedom.
- ❑ **SD** requires actions in collaborative **Partnership**
- ❑ **Challenges of SDGs**
 - Extreme poverty
 - Interlinkages and integrated nature of SDGs

Source: <http://lusaka.sites.unicnetwork.org/the-sustainable-development-goals/>

Institutional Setup Process



National Commission on Sustainable Development
(NCSD)



The Cabinet approved the set up of NCSD, proposed by MONRE.



Regulation of the OPM on the NCSD was announced in the Royal Thai Government Gazette

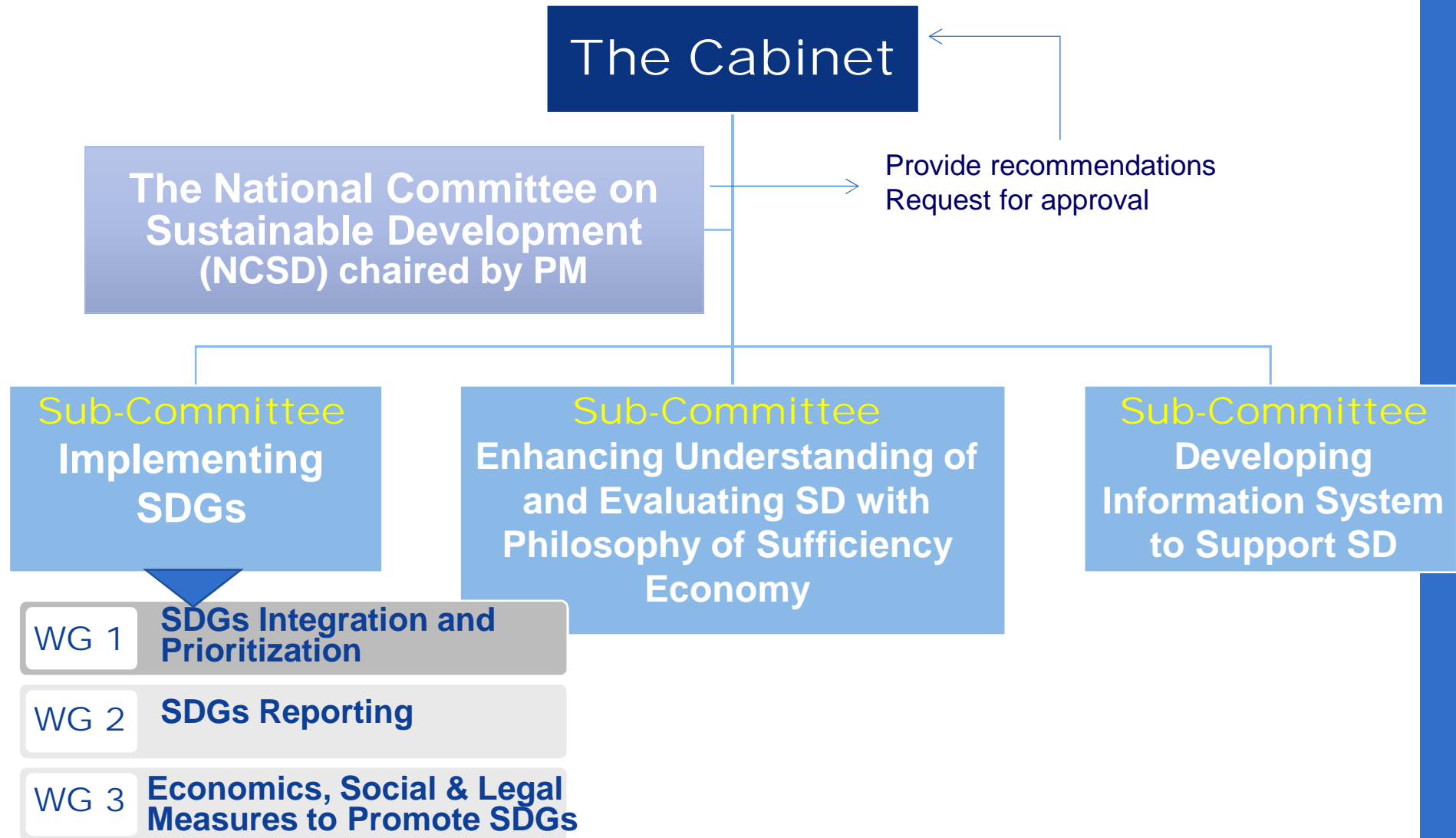


The Cabinet approved the amendment of the Regulation of the OPM on the NCSD by changing the components and assigning NESDB as a secretariat of the committee



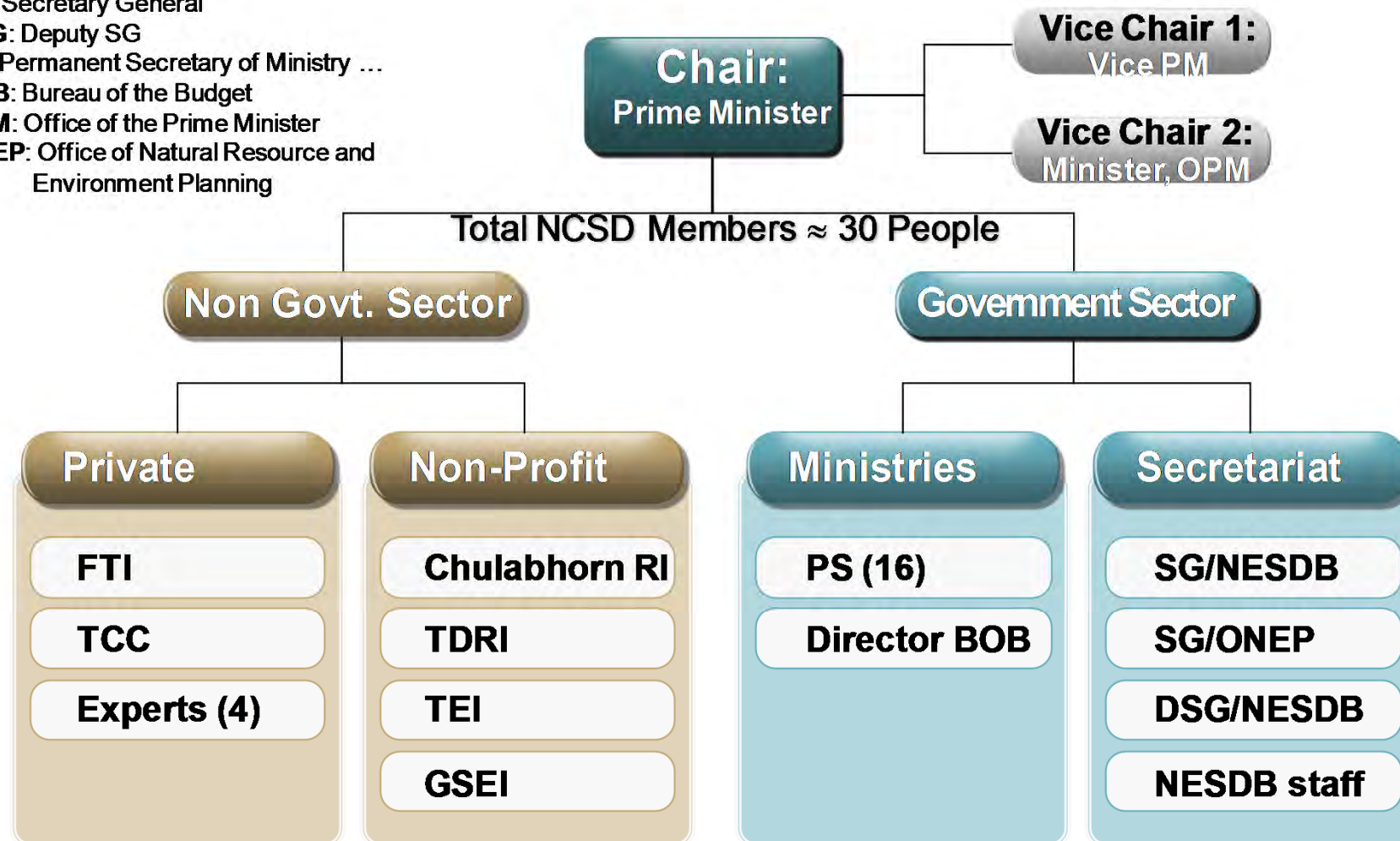
Regulation of the OPM on the NCSD No. 2 was announced in the Royal Thai Government Gazette

Institutional Structure of SDGs



NCSD : Structure & Components

SG: Secretary General
DSG: Deputy SG
PS: Permanent Secretary of Ministry ...
BOB: Bureau of the Budget
OPM: Office of the Prime Minister
ONEP: Office of Natural Resource and Environment Planning



FTI: Federal of Thai Industry

TDRI: Thailand Development Research Inst.

CRI: Chulabhorn Research Inst.

TCC: Thai Chamber of Commerce

TEI: Thai Environment Inst.

GSEI: Good Governance for Social Dev. & Environment Inst.

NCSD : Mandates

1. **Formulate policies and strategies on national sustainable development**

by integrating and balancing the economic, social and environmental pillars, which comply with related international agreements. Then, submit these SD policies and strategies to the Cabinet for approval

2. **Promote and support the implementation of public** and private sector on sustainable development

3. **Keep track on the government implementation of SD** strategies and other international agreements relating to SD

4. **Provide recommendations to the Cabinet** on the use and improvement of economic, social and legal measures to support SD

5. **Set the direction and position of Thailand on SD** in any international meetings on SD

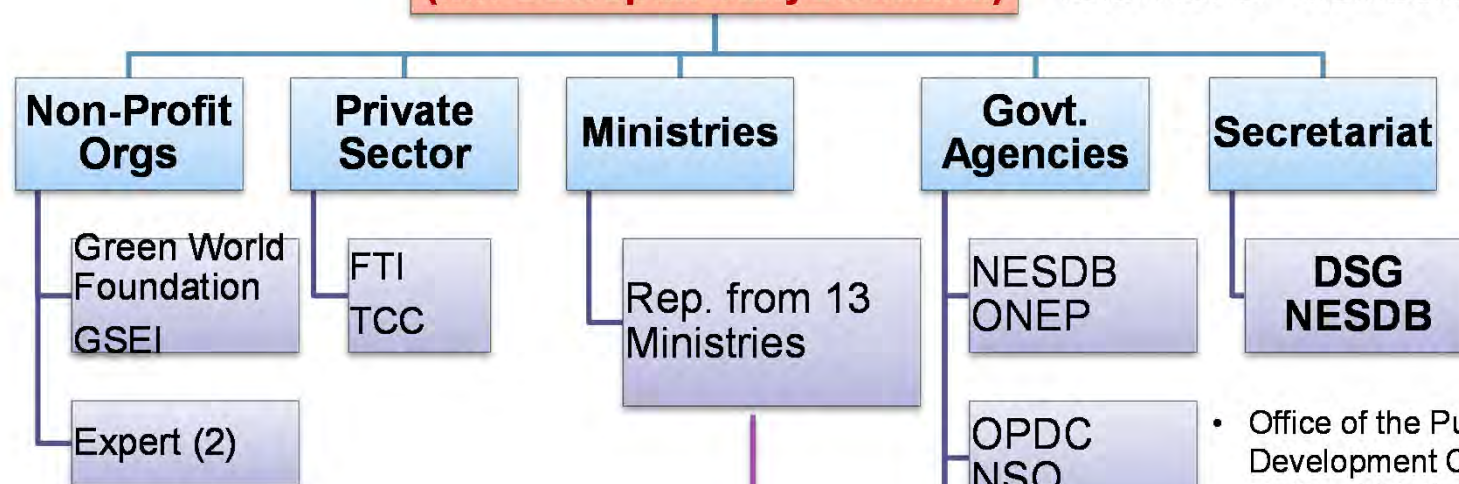
6. **Monitor and evaluate both public and private sectors** on the implementation of SD strategies and other international agreements relating to SD

Sub-committee on Implementing SDGs

Components

Chair:
Minister of OPM
(Mr. Suwapan Tanyuwattana)

Total No. of Members = 31



Interior	Science & Technology	Public Health
Finance	Info Technology & Communication	Energy
Commerce	Natural Resource & Environment	Industry
Labor	Agriculture & Cooperative	
Education	Social Development & Human Security	

GSEI Good Governance for Social Development & the Environment Institute
 FTI Federation of Thai Industry
 TCC Thai Chamber of Commerce

- Office of the Public Sector Development Commission
- National Statistics Office
- National Research Council of Thailand
- Thailand Research Fund
- Office of Justice Affairs
- Thailand Institute of Justice

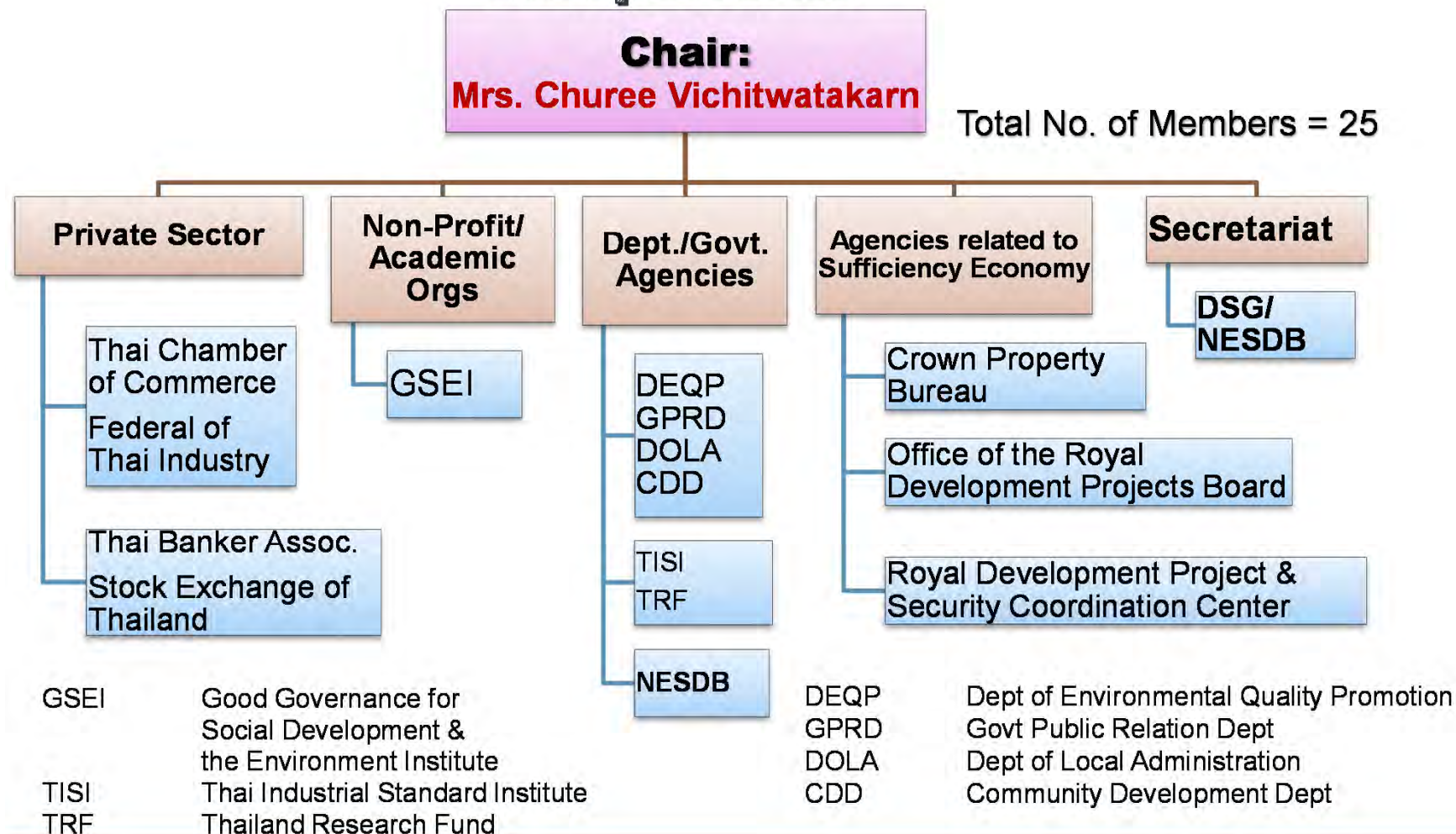
Sub-committee on Implementing SDGs

Mandates

- **Set guidelines for implementing, coordinating, monitoring, and integrating** actions of related departments and ministries to achieve each SDG targets
- **Create baseline data of SDGs indicators** suggested by UN while coordinating with related departments and ministries to develop SDGs indicators suited to Thailand contexts
- **Make recommendations on necessary economic, social and legal measures** to support sustainable development
- **Prepare for the system of SDGs monitoring and evaluation**, and the SDGs reports for submission to the UN Secretary General
- **Monitor and evaluate the implementation** by both public and private sectors. Analyze problems and barriers in achieving SDGs to come up with solutions proposed to NCSD
- **Set up relevant working group** to assist the sub-committee
- **Perform other tasks** upon requested by NCSD

Sub-committee on Enhancing Understanding of and Evaluating SD with Philosophy of Sufficiency Economy

Components



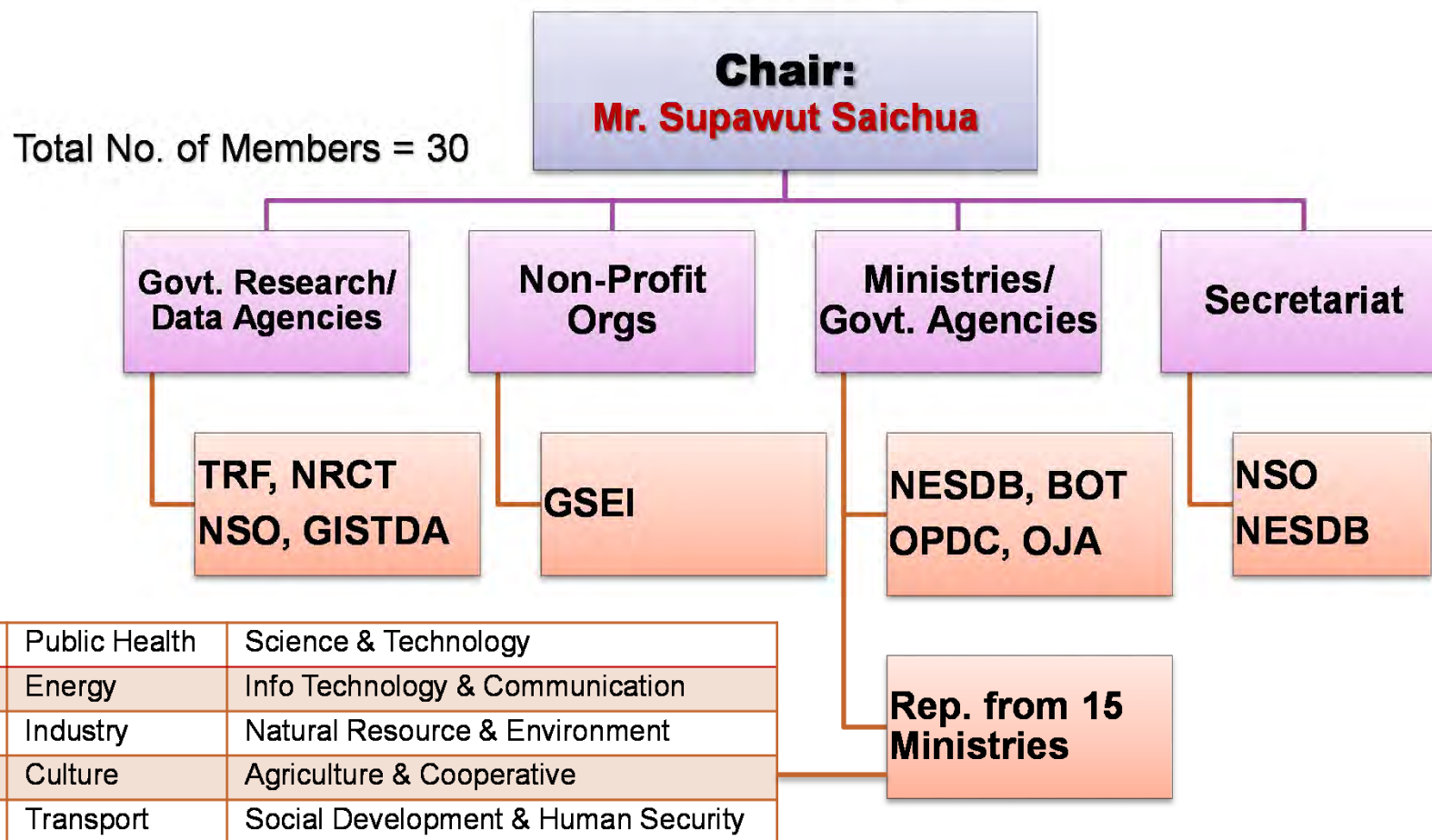
Sub-committee on Enhancing Understanding of and Evaluating SD with Philosophy of Sufficiency Economy

Mandates

- **Study and create understanding of “Sustainable Development” in relation with “ Sufficiency Economy”**, which is the key concept of development in Thai context, in the general public
- **Make recommendations about public relation , generate knowledge and understanding** and public communication
- **Create networks and community of practice** in applying Sufficiency Economy and sustainable development
- **Prepare for the monitoring and evaluation system**, as well as suggest for solution to overcome barriers in implementation
- **Invite experts from various fields** to give advices and recommendations about implementing Sufficiency Economy in different target groups
- **Perform other tasks** upon requested by NCSD

Sub-Committee on Developing Information System to Support SD

Components



GISTDA Geo-Informatics & Space Technology
Development Agency (PO)

Sub-Committee on Developing Information System to Support SD

Mandates

- **Set guidelines for creating a national central database to support policy formulation and decision making**, covering natural resources (i.e. land, forest, energy), public service management, use, access, and ownership of natural resources
- **Integrate government implementing guideline** in creating central database to consolidate data collection by central and local government as well as private sector
- **Prepare a system for monitoring and evaluation of Thailand's data and statistics** to keep them up-to-date and useful for SDGs indicator, while serving as a framework for core strategies and policies under the 20 Year National Strategy
- **Monitor and evaluate the implementation** by both public and private sectors. Analyze problems and barriers in achieving SDGs to come up with solutions proposed to NCSD
- **Set up relevant working group** to assist the sub-committee
- **Perform other tasks** upon requested by NCSD

Climate Change Adaptation in Selected Sectors

Water Resource Management, Green Cities and
Sustainable Agriculture

Conceptual Framework of Water Management



Conceptual
Framework

Integrated Approach

Water resource management of the country needs an integrated approach, with all relevant agencies working together through an efficient management mechanism.

Benefits to people and country as first priority

Effects the projects have on the people needs to be taken into account, such as people's relocation, occupation, and income.

Creating understanding

Project implementation needs to inform stakeholders about relevant information prior to and during implementation with simple and straight forward language.

Clear direction on management

Short-term, medium-term, and long-term plans are needed (1-year, 5-year, and 10-year plans) with clearly stated objectives and the activities and implementation in each year, as well as public relations to ensure information dissemination.

Framework of Water Management

Upper river basin

Priority given to slowing down speed of the water flow

Middle river basin

Priority given to the water management such as dam management, floodway and monkey cheek construction

Lower River basin

Importance given to increasing flows of water out to the sea

King's initiatives regarding water management

1 Royal Rain: Drought solution

2 Forest: Water restoration

3 Check dam: Water retarding

4 Vetiver Grass : Land slide prevention

5 Reservoir : Water restoration at hill base

6 Dam : Water restoration

7 New Theory Agriculture

9 Dike

8 Flood retention area

11 Chaipattana-water-turbine

Flood way

10

12 Mangrove

Framework for Developing Green Cities



Eco-Industrial Towns

- **Develop eco-industrial towns and restore the environment in major industrial regions** by creating awareness of the need for coexistence between industries and communities. Stakeholders should collaborate in the development and include the public and private sectors, communities, and academic institutions.
- **The process of developing eco-industrial towns** should start by setting the development framework and providing the components necessary to implement the eco-industrial town concept and strengthen standards for environmental and natural resource quality.
- **Health impact management** and establishment of environmental surveillance centers in risk areas are important.
- **Measures should be put in place to encourage the private sector** to invest in environmental rehabilitation. This will take the form of corporate social responsibility along with cooperation of communities and the public sector.

Framework for Developing Green Cities



Livable Cities

Provide access to low-income housing and public amenities

Assure safe housing for workers; provide residential areas devoid of social conflict for migrant laborers from nearby countries; and develop housing projects for low-income groups that are widely distributed to reduce urban congestion



Creative Cities

Strategy to restructure the economy toward quality and sustainability

Creative businesses and cities should be developed. Promote development of creative cities by establishing ecological principles that are applied to physical infrastructure, human resources, regulations and management. These factors will facilitate the cluster development of innovative businesses in utilizing local insight and products and services that are identified with the area, and will attract investment into targeted cities.

Framework for Developing Green Cities



Environmental Friendly Cities

Develop environmentally friendly cities with emphasis on integrated urban planning having cultural, social and ecological aspects

- **Develop compact urban designs** where areas are used creatively, with emphasis on the expansion of green spaces and increased energy efficiency. Infrastructure design technology, improved transport systems and energy saving residential buildings should be promoted. In addition, an ecologically sound urban model should be developed and specific green areas set aside for agriculture and urban farms.
- **Supervise intensive land use both inside and beyond cities** and establish measures to curb urban sprawl. Plan to incorporate public art and designate cultural heritage sites. Communities and LAOs should develop areas at the sub-district, district and provincial levels, and these should be relevant to the means and lifestyle of the inhabitants as well as to the sustainable capacity of these areas.

Framework for Sustainable Agriculture



Sustainable Development in Agriculture

Focusing on
Balance
And
Sustainability

Resource Base Sustainability

- Decrease in national resource degradation / enhancement in fertility
- Efficient management in conservation and utilization

Increase in Competitiveness

- Improvement in productivity / production cost reduction
- Demand and supply management
- R&D + Value added creation in supply chain
- Development of logistic system
- Strong networking /integration /area based development

Improvement of Farmers' Life quality

- Farmers are secured in food and arable land
- Sufficiency in agricultural income
- Debt decrease and move out from poverty

5 Types of Sustainable Agriculture Practices

1) Organic Farming



Farming system that uses only organic fertilizer and herb-based insect-control compound.

- The reasons of practicing organic farming are a higher demand for organic food and demand for improving soil quality and underground water quality.
- Until recently, organic rice and vegetables had been sold only in Bangkok and other major cities. Yet, the market of organic food is now increasingly expanding.

2) Integrated Farming



Farming system that has at least two different agricultural activities in the same field, for example, paddy and fish raising, or pig farming, fish raising and vegetable plantation.

- Practicing various agricultural activities at the same time helps reduce costs, that is, the economy of scale is working. For instance, manure and other farm residues can be used as fertilizer when planting crops.
- This system is suitable for a small-scale farmer, letting him make best use of limited field area.
- In practice, the system is widely used in the central area of Thailand, where there are a plenty of water resources.

5 Types of Sustainable Agriculture Practices

3) Natural Farming



Natural farming's concept is no tillage, no application of fertilizer, herbicide and insecticide.

- For the ecological preservation aspect, natural farming is ultimate sustainable agriculture practice.
- At the present, there is nowhere perfectly practicing the natural farming system in Thailand. Yet, a few natural farming cases can be seen in the Northeastern.

Agroforestry is an idea to put agriculture and afforestation together, that is, to plant cash crops or raise livestock while planting trees in the same area.

- Its objectives are not only to increase farmers' income, but also to decrease deforestation induced by agricultural area expansion. Besides, it also helps improve the soil quality and biodiversity.
- Agroforestry is conducted in the Northern and Southern areas.

4) Agroforestry



5) New Theory Farming

Agricultural system proposed by His Majesty the King Bhumiphol Adulyadej in 1993. Its basic concept is self-sufficiency.

- Crop selling is a next step after attaining self-sufficiency.
- The concept is most appropriate to the farmers that have limited small field and lack water.

New Theory Farming System in Thailand

Divide the field into 4 parts in the approximate ratio of 30:30:30:10

30% Pond

- Water saving for all year round
- Fish Aquaculture to increase more income
- At the edge of the pond - growing vetiver grass to protect soil erosion

30% Paddy Field



- One crop /year
- Storage for year round consumption



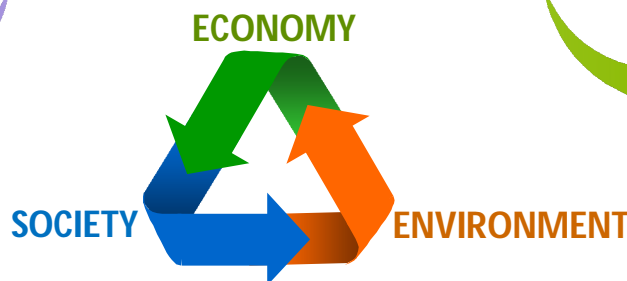
30% Trees/crops

- Fruits trees
- Perennial trees
- Annual tress
- Herb and spice
- Multi-purpose trees
- Field crops

10% Residential



- Other activities: vegetable, herb, mushroom, livestock



Thank you

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