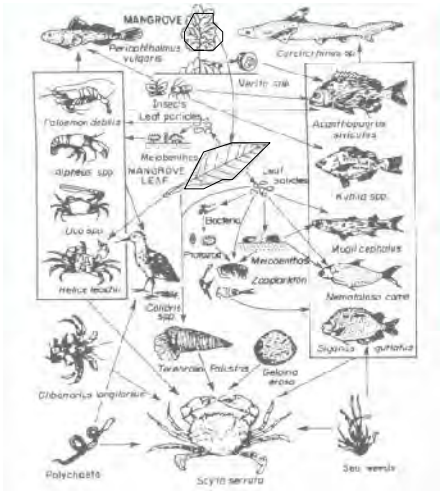
•Richness of swamp forests

Ranong, Thailand Dec 15, 2009

Fishery



Food web initiated from mangroves

26

Forestry (mangrove charcoal production)

27

Rich incentives from riparian swamp forest

wood

fuel

food

28

Rich incentives from riparian swamp forest

Fishing trap crossing river

Many fishing gears observed in flooding forest

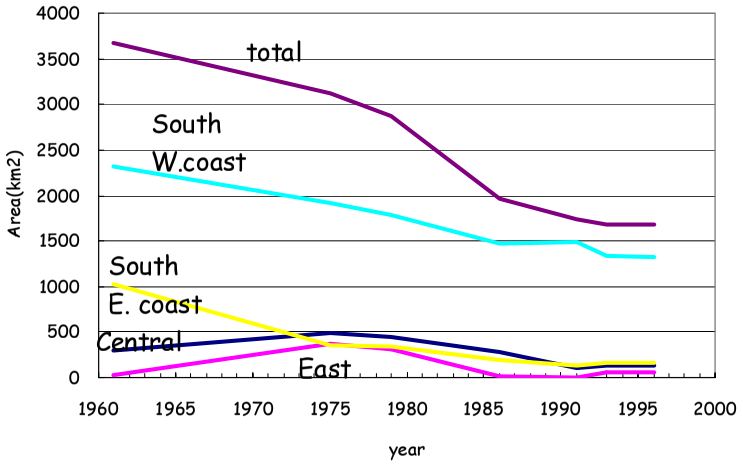
• Threat

Ranong, Thailand Dec 15, 2009

Deforestation - Thai case

- 1948 60~70% covered by forest
- 1962 62% of National area (Land's 77%)
- By 1990's → around 20%
- Even after logging ban (1989)
- Same deforestation rate lasts after
  NF Logging ban in 1989
  200,000 ha/yr

Decline of mangroves in Thailand



33

Disappearing Thai forests

- Thailand
  - Forest cover >50% decreased to <20% within a half century
  - Mangrove forests
    - ca.2000km^2(55%) was lost within 35years(1961-1996)
      - –>60% was converted to shrimp pond
  - – Easy access, flat ground

A4-234

Threats arose by swamp forest deforestation

- Loss of local livelihood and cultural base
  - Forest products (wood･non-wood)
  - Fishery resource even influences to deep sea fishery
  - Less profitable in long term investment
  - High cost for fertilizer, food, sanitary care after momentary high harvest
- Release of huge organic carbon
  - Deforestation→desiccation/oxidization→CO_2 release
- We need to stop deforestation ASPS

35

• Hope

Ranong, Thailand Dec 16, 2009

Communities' Initiatives to conserve swamp forests

mangrove forests

Attention grown up after Tsunami in 2004

Riparian swamp forest

Riparian forest recovered in 20 yrs after closing farmyard

A4-235

Studies on the conservation measures of swamp forest through sustainable use of ecological resources by community forestry

(1) Dynamics of ecological resources in swamp forests in 50 years

(2) Fishery resources and their use

(3) Sustainable use, management and protection of swamp forest

(4) Necessities for community forestry supporting policy

Community forestry
participatory forest management

- Indispensable to effective forest management and conservation
  - Necessity: well recognized
  - Experience: many but not shared well.
  - A few success cases are highlighted repeatedly but many failure cases are hidden.

Do environmental policies support community forest management?

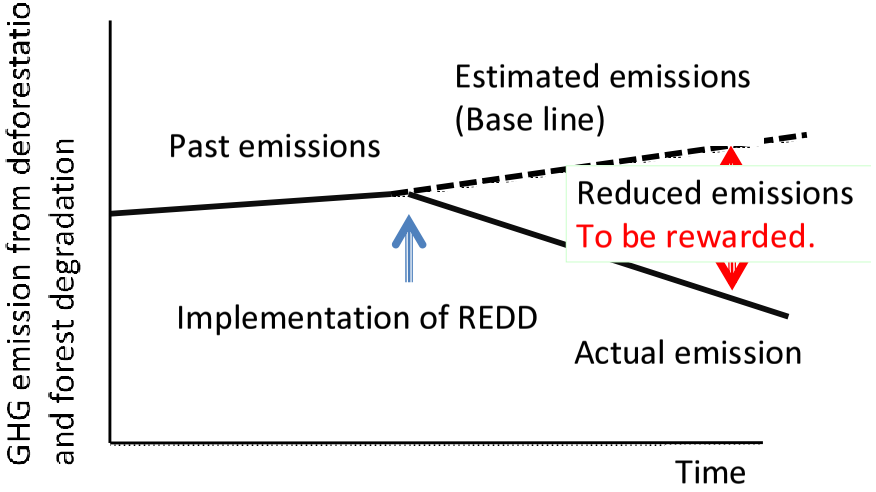
Takeshi TOMA

Forestry and Forest Products Research Institute, Japan

Do environmental policies support community forest management?

- It depends on situation.
- Policies may encourage or discourage communities to manage their forests sustainably.
- As an example, REDD+ is expected to deliver direct economic benefits to local communities who manage forest in sustainable way.
- At the same time, expectation to the role of local communities for implementing REDD+ is increasing.

The core idea of REDD is that reward the reduction of green house gas emission from forests.



About REDD

- Reducing Emissions from Deforestation and forest Degradation in developing countries (REDD) has been discussed under UNFCCC as an important option for mitigating climate change.

- REDD is based on a simple idea:
- reward individuals, communities, firms, projects and countries that reduce forest-related greenhouse gas (GHG) emissions.

Angelsen(2009) "Will REDD make a difference?"

According to the proponents:

REDD has a *huge potential* (one-fifth of current global GHG emissions),

REDD is *cheap* (many deforestation and degradation activities are only marginally profitable),

REDD can be done *quickly* ('stroke-of-pen' reforms and no new technologies needed), and

REDD can produce *win-win-win* outcomes (climate, biodiversity and livelihood benefits).

"REDD+" "REDD plus" refers to

- reducing emissions from deforestation and forest degradation; REDD Plus
- increasing removals from enhancement of forest carbon stocks; forest conservation;
- and sustainable management of forests.

Creditable activities in a REDD+ mechanism

Changes in:	Reduced negative change	Enhanced positive change
Forest area (Number of hectare)	Avoided deforestation	Afforestation and reforestation (A/R)
Carbon density (Carbon per hectare)	Avoided degradation	Forest regeneration and rehabilitation (carbon stock enhancement)

Source: Angelsen and Wertz-Kanounnikoff (2008)

Community forests

- Local communities are not always managing forests in sustainable ways.
- We need to understand the potential of community forest management as well as the limit of it.
- The challenge now is to build on experience and to avoid repeating the mistakes of the past.

Burnt forests

Planting trees

For fire prone area, forest rehabilitation needs to have a measure for controlling fires. Otherwise, fires would occur and burn the planted area repeatedly.

In fact, many cases, the beneficiaries of forest rehabilitation projects subsequently burned the project area so that they could be re-employed in the process of replanting or rehabilitation.

- There is an increased recognition that involvement of local communities is fundamental for managing tropical forests in sustainable way.
- A number of initiatives have been conducted to promote sustainable forest management by involving local communities.

- There have been many reports that local communities manage their forests in sustainable way with and without external support.

At the same time, many communities have been destroying their forests for their own interests.

- It should be noted that local communities manage forests in sustainable way only under specific conditions and communities may destruct their forests because of various reasons.
- We cannot expect a successful case at a specific site can be achieved at different sites.

We need

- to share our knowledge on the potential and limit of community involvement for sustainable forest management in the tropics.
- to identify the gaps between the expectation to the communities and actual situation of community forest management.

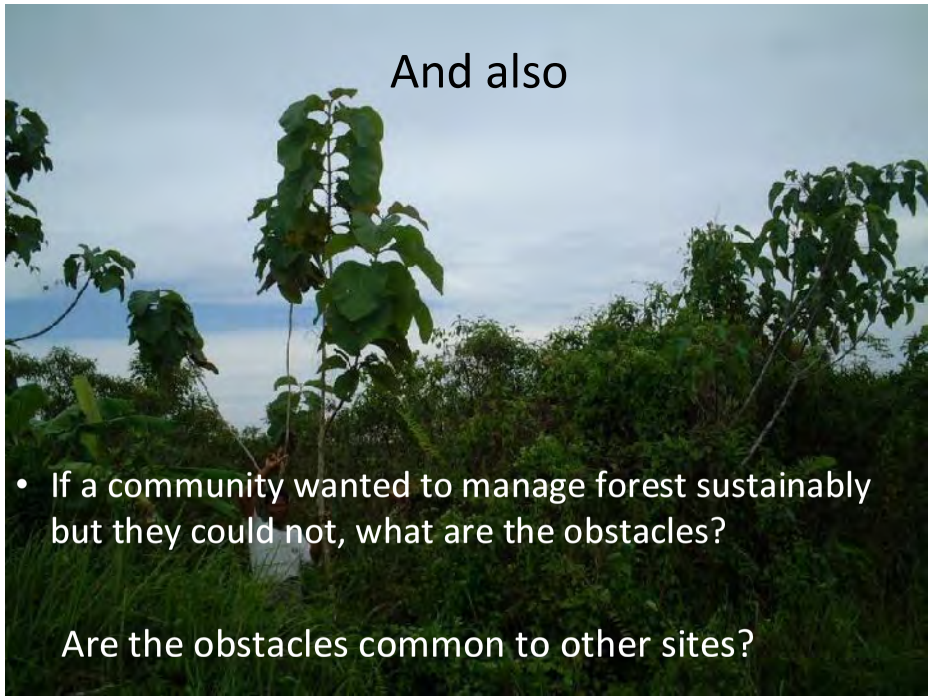
We should ask

- Do local communities want to manage forest sustainably?
  - If so, what are the incentives?
  - If not, what may change their perception?

We should ask again

- If a community managed their forests in sustainable way, what factors allow the success of the sites?

Are there success factors common to the other sites?

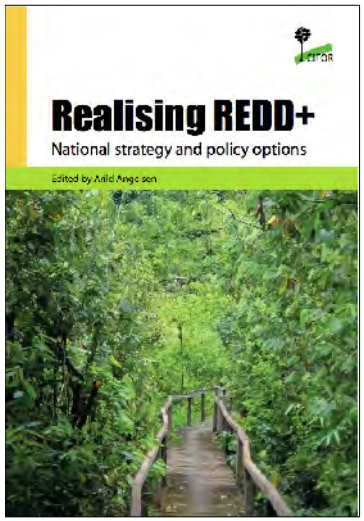


And also

- If a community wanted to manage forest sustainably but they could not, what are the obstacles?

Are the obstacles common to other sites?

A book from CIFOR includes a review on community forest management for REDD+



Using community forest management to achieve REDD+ goals

concludes

- The literature on successful community forest management (CFM) is highly relevant to REDD+ initiatives at the local level.
- Secure tenure and the ability to exclude others are important, as is community involvement in designing the rules.

concludes

- In turn, the rules must be simple, locally enforceable, and include accountability.
- However, it also cautions that, aside from institutional design, many factors in CFM success are exogenous, suggesting that externally supported interventions should be targeted to areas where they are likely to work.

- We are planning to hold an International workshop entitled
- "Strategies of Local Livelihoods for Sustainable Management of Swamp forests"
- on 13-15 December 2011, in Bangkok, Thailand.

- See you in Bangkok
- Thank you for your attention

Ranong, Thailand Dec 16, 2009

Japan's Greenhouse Gas Inventory and Greenhouse Gas Inventory Office of Japan (GIO)

Akihiro TAMAI
Greenhouse Gas Inventory Office of Japan (GIO)
National Institute for Environmental Studies (NIES)
www-gio@nies.go.jp

TGO Training Course
31 August 2011

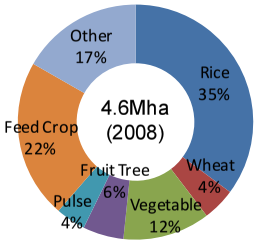
- Energy
- Industrial Processes
- Solvent and Other Product Use
- **Agriculture sector**
- **LULUCF sector**
- **Waste**

Part 2
Japan's Greenhouse Gas Inventory

Agriculture Sector

Japan's Agriculture

- Agriculture is not a major industry in Japan.
  ⇒Food self-sufficiency rate is low (about 40%).
- Rice is the staple food in Japan.
  ⇒Rice cultivation (paddy field) is the main form of agriculture throughout the country.
- Cultivated area covers 11% of the national land.
- Dairy Cattle, Beef Cattle, Swine, Hen and Broiler are the major livestock.
- Livestock are raised in sheds in most case.
- Composting and Piling are major manure management system.



Cultivated Area

Agriculture Sector

Subjects of Estimation

4.A. CH_4 Enteric Fermentation	1. Cattle	Dairy Cattle	C
		Non-Dairy Cattle	C
	2.-8. Swine, Buffalo, House, Goats, Sheep		C D
4.B. CH_4 N_2O Livestock Manure Management	1. Cattle	Dairy Cattle	C D
		Non-Dairy Cattle	C D
	8. Swine		C D
	9. Poultry		C D
	2.-7. Buffalo, House, Goats, Sheep		C D
4.C. CH_4 Rice Cultivation	1. Irrigated	Intermittently Flooded	C
		Continuously Flooded	C
4.D. N_2O Cropland Soil	1. Direct Soil Emission	Synthetic Fertilizer	C
		Organic Fertilizer	C
		Crop Residue	C D
		N-fixing Crops	C D
		Plowing of Organic Soil	D
	2. Pasture, Range and Paddock Manure		C
	3. Indirect Soil Emission	Atmospheric Deposition	D
		N leaching & Run-off	C
4.F. Field Burning of Agricultural Residue CH_4 N_2O			C D

Non-CO_2-GHGs emitted through various agricultural activities are evaluated.

Letters in red stand for that they are Key Categories in FY 2008.

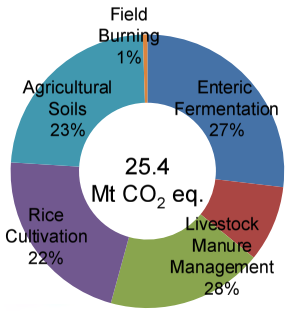
C Use of country-specific EFs

D Use of IPCC default EFs

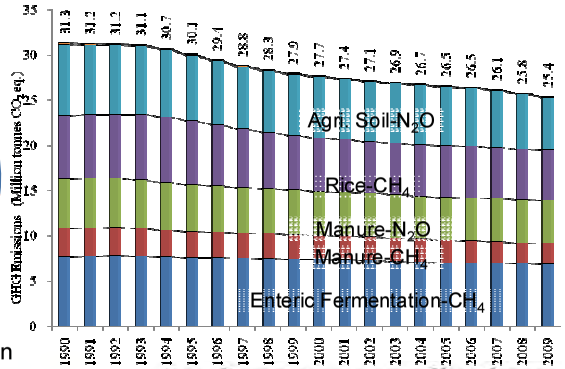
A4-244

GHG Emissions from Agricultural Sector in FY2008

- 25.4 MtCO_2eq. in 2009. 2% of total Emission.
- Constantly decreasing since 1990
- Main driving factors are decrease of rice cultivation CH_4 caused by crop area decline and decrease of agricultural soil N_2O caused by decrease of amount of applied fertilizers



Proportion of GHG Emission (FY 2009)



Agriculture Sector

Japan's major statistics for AD

Cate-gory	Activity Data	Statistics	Ministry
4A, 4B	*Livestock population*	Livestock Statistics (Key sub-category)	MAFF(Ministry of Agriculture, Forestry and Fisheries)
		(Other) statistics (Non-key sub-category)	MAFF
4C	*Rice field area*	1. Statistics of Cultivated and Planted Area	MAFF
4D,4F	*Crop field area*	2. Crop Statistics	
4D	*Synthetic fertilizer N applied*	Yearbook of Fertilizer Statistics (Pocket Edition)	MAFF

Agriculture Sector
Enteric Fermentation (4.A.)

- 96% of emissions from enteric fermentation derive from cattle.
- Japan specific method is used for cattle. (similar to the Tier 2 Method)
- Estimated by type and age.
- EFs are decided by Dry Matter Intake. (DMI is calculated by correlation between age and weight)
- These factors are developed from domestic research results.

- Estimation Method for EF is follows in IPCC GL; EF=(Energy Intake) × CH4 conversion factor

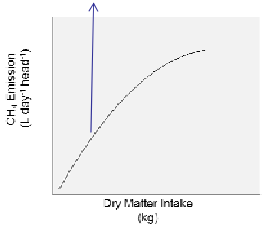
Agriculture Sector
Enteric Fermentation (4.A.)

Ex. Estimation of CH_4 Emission from Cattles

$$E = EF * A$$

$$EF = Y / L * C * D$$

$$Y = -17.766 + 42.793\,X - 0.849\,X^2$$



A: **Herd size (head) for each type of cattle (dairy and non-dairy) [head]**

EF: **Emission factor [kg CH_4/head]**

Y: CH_4 generation per day associated with enteric fermentation per head of ruminant livestock [L/day/head]

L: Volume per 1 mol of methane (22.4 [L/mol])

C: Molecular weight of methane (0.016 [kg/mol])

D: Number of days per year (365 or 366 [days])

X: Dry matter intake [kg/day]

A Method specific to Japan was used here (similar to the Tier 2 Method)

Agriculture Sector
Enteric Fermentation (4.A.)

Categories of cattle for calculation purposes

Type of animal	
Dairy cattle	Lactating
	Non-lactating
	Heifers (under 2 years old, excluding 5- and 6-months old)
	Heifers (5 to 6 months old)
Non-dairy cattle	Breeding cows (1 year and older)
	Breeding cows (under 1 year, excluding 5- and 6-months old)
	Breeding cows (5 and 6 months old)
	Japanese cattle (1 year and older)
	Japanese cattle (under 1 year, excluding 5- and 6-months old)
	Japanese cattle (5 to 6 months old)
	Dairy breeds (excluding 5- and 6-months old)
	Dairy breeds (5 to 6 months old)


Beef Cattle in Shed

Manure Management(4.B.)

EF (gCH_4/g-Organic Matter) CH_4

D:Default | CS: Country-Specific

Treating method		Daily Cattle	Non-daily cattle	Swine	Hen, Broiler
12. Pit storage		D	D	D	—
13. Sun drying		CS	CS	CS	CS
14. Other	14a. Thermal drying	Other			
	14b. Composting (feces)	D	D	CS	CS
	14c. Piling	CS	CS	CS	CS
	14d. Incineration	Other			
	14e. Composting (liquid)	D	D	D	—
	14e. Composting (feces and urine mixed)			CS	
	14f. Purification	D	D	D	

➢As research on actual emissions has been conducted, EFs are revised continuously.

NIR Table6-9

Manure Management(4.B.)

- In Japan, composting is widely practiced, particularly with respect to domestic livestock feces. Consequently the composting-related subcategories of "Piling" and "Composting" have been established under the Other category.

Manure Management(4.B.)

- Composting :Fermented for several days to several weeks with forced aeration and agitation in lidded or closed tanks

Manure Management(4.B.)

- Piling: Piled on compost bed or in shed to ferment for several months with occasional turning

Agriculture Sector

Manure Management(4.B.)

- The reasons that composting is widely practiced in Japan
  - ➢ To facilitate transportation and handling
    - ✓ lack of space required for the on-site reduction of manure
  - ➢ Higher demand as a fertilizer than is slurry or liquid manure
    - ✓ fertilizers tend to be lost by heavy rain
    - ✓ the expectations of the protection of water quality, prevention of odor, and sanitary management are high.

Paddy field (Ogata village, Akita Pref.)

Agriculture Sector

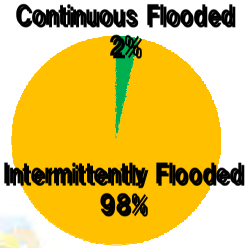
Rice Cultivation (4.C.)

(Emissions) = (Emission Factor) × (Cultivated Area)

Scientific Articles researched by NIAES (Country-specific EF)

Statistics Cultivated and Planted Area by MAFF

➢ **In Japan, all paddy field is irrigated.**



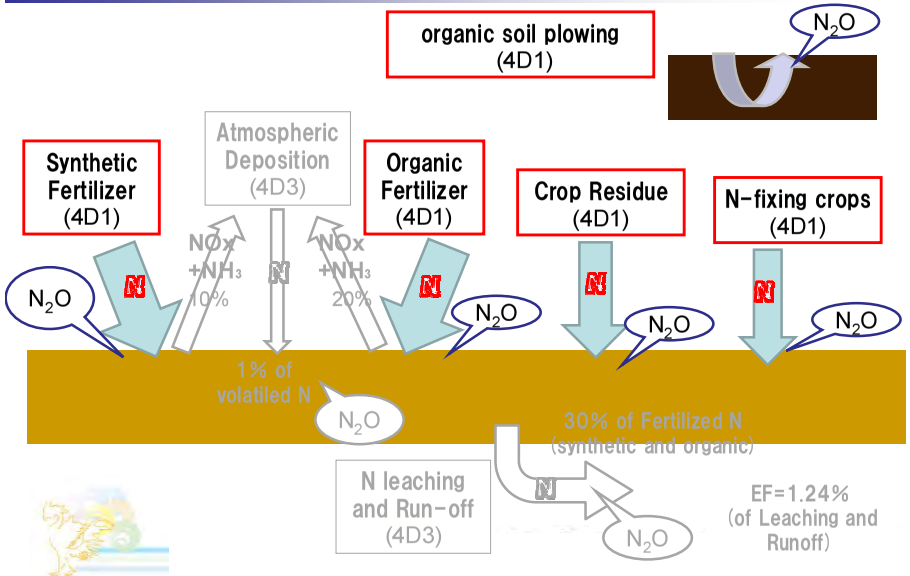
Ratio of cultivation method

Japan's standard style for rice cultivation

Tono-furusato villages (Iwate Pref.)

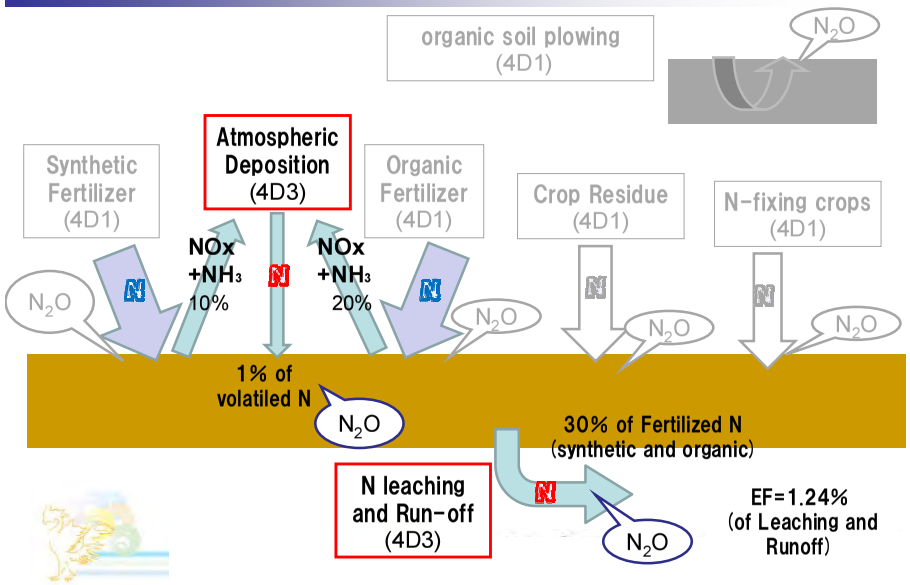
Agriculture Sector

Agricultural Soil(4.D.) -Direct emission-



Agriculture Sector

Agricultural Soil(4.D.) -Indirect emission-



Agriculture Sector

Agricultural Soil(4.D.) -Direct emission-

N_2O from Synthetic Fertilizer = Σ (EF by crop type × Amount of synthetic fertilizer used in each crop field)

EF(kgN_2O-N/kgN)

Paddy Rice	0.31%
Tea	2.9%
Other crops	0.62%

CS-EF by NIAES

Yearbook of Fertilizer Statistics

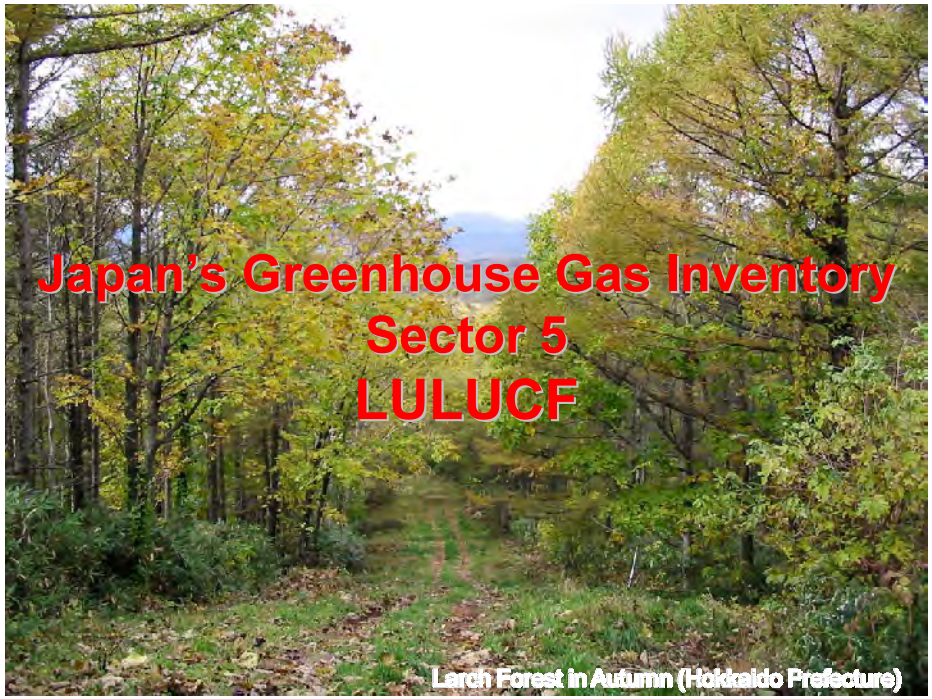
N_2O from Organic Fertilizer = Σ (EF by crop type × (Volume of N applied by crop type × Cropland Area)

Paddy Rice: Yearbook of Fertilizer Statistics
Tea: Nonaka *et al.* (2005)
Other Crops: Project Report

Statistics by MAFF

Crop type	Vegetables, Fruit, Potatoes, Pulse, Feed crops, Sweet potato, Wheat, etc.

A Measurement of GHG
(National Institute for Agro-Environmental Sciences)



Japan's Greenhouse Gas Inventory
Sector 5
LULUCF

Larch Forest in Autumn (Hokkaido Prefecture)

Photo: Rice terrace surrounded by intensively managed forest in Mie pref.

Photo: Urban park in Japan