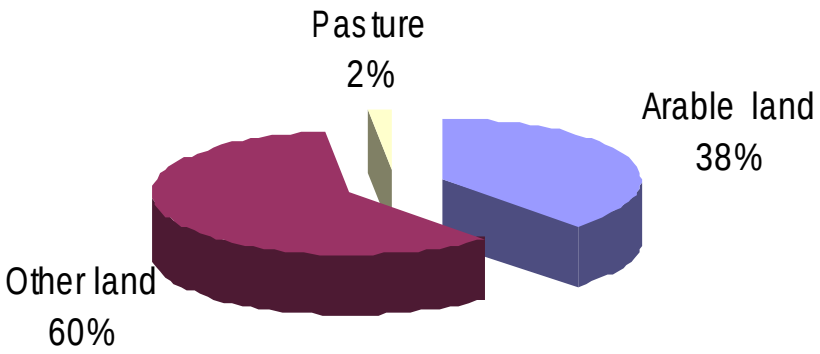
# Thailand Greenhouse Gas Inventory in Agricultural Sector

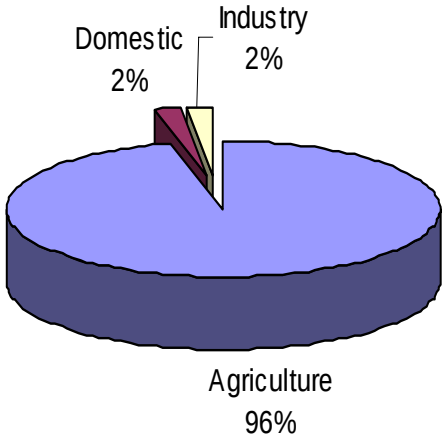
Amnat Chidthaisong

Joint Graduate School of Energy and Environment

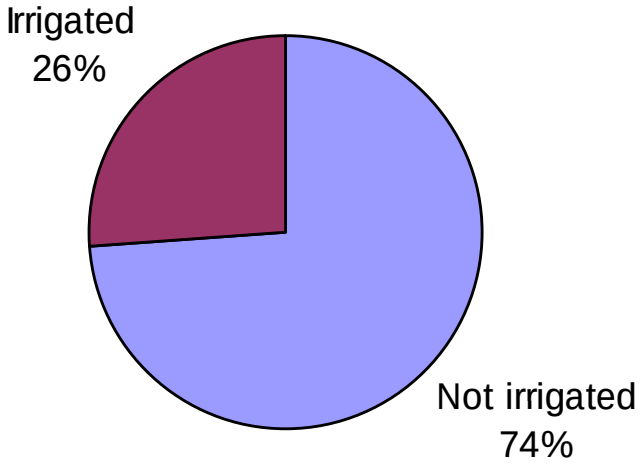
# Land use 2000



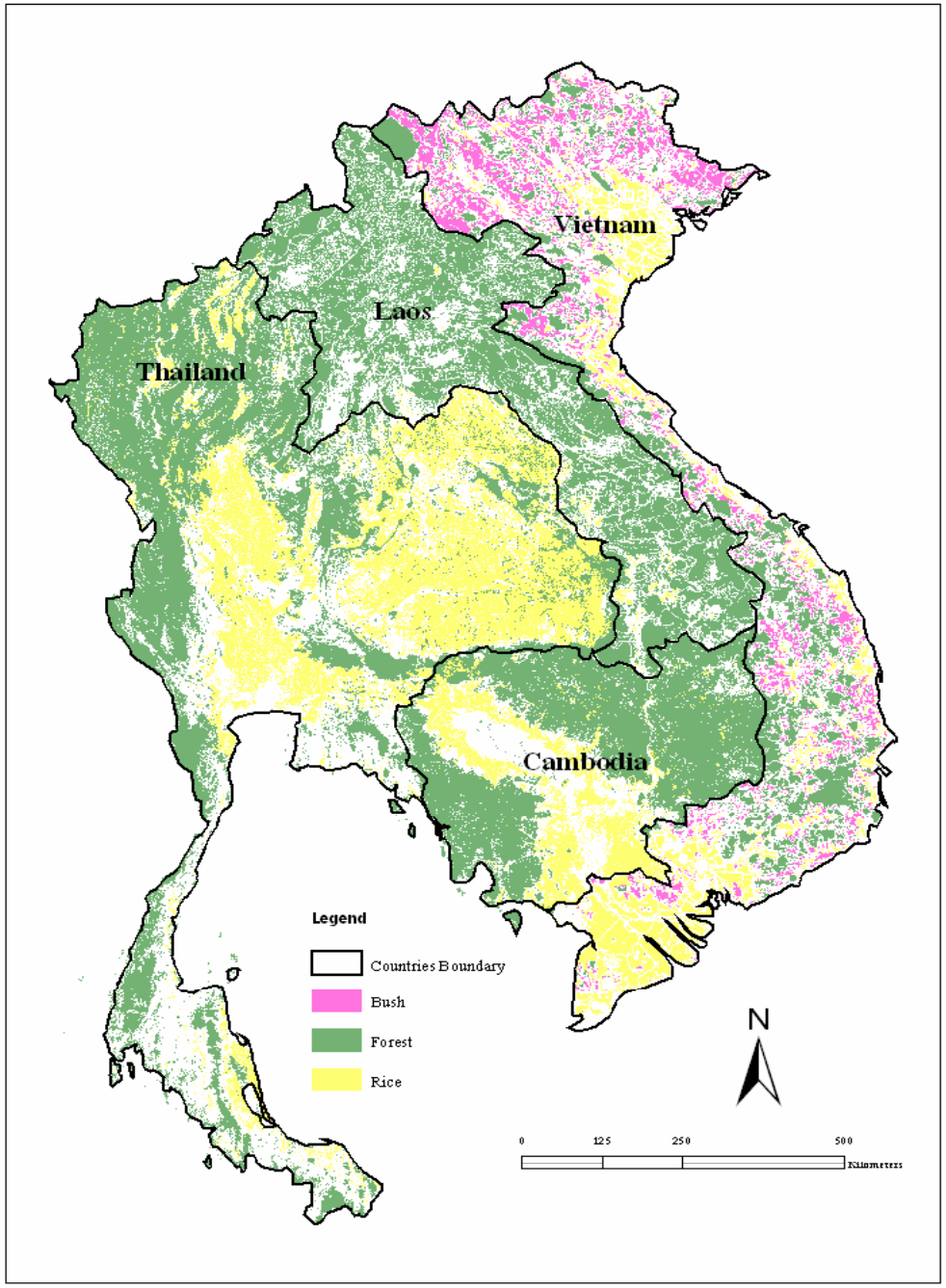

# Water use 2000

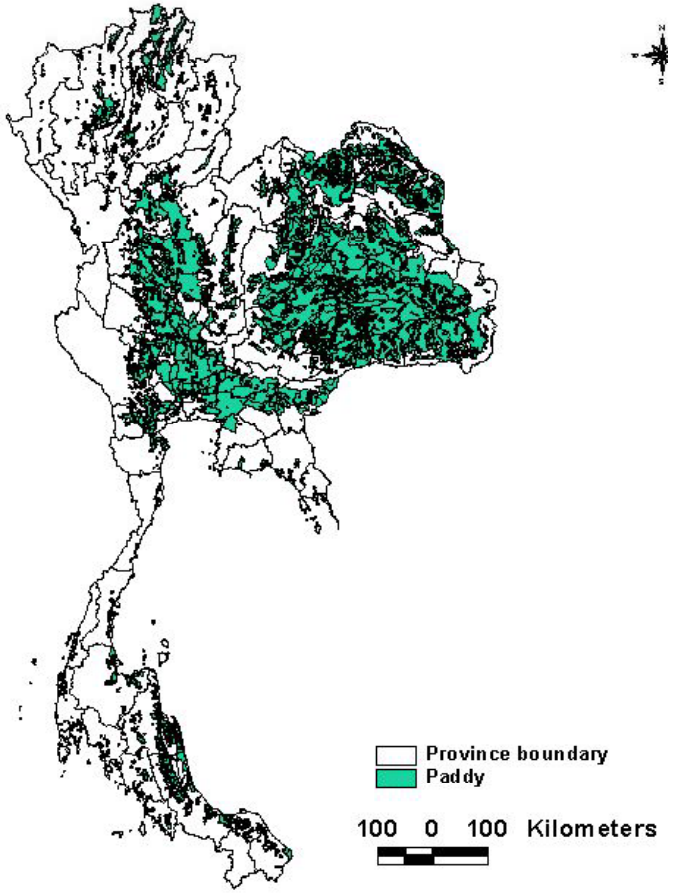


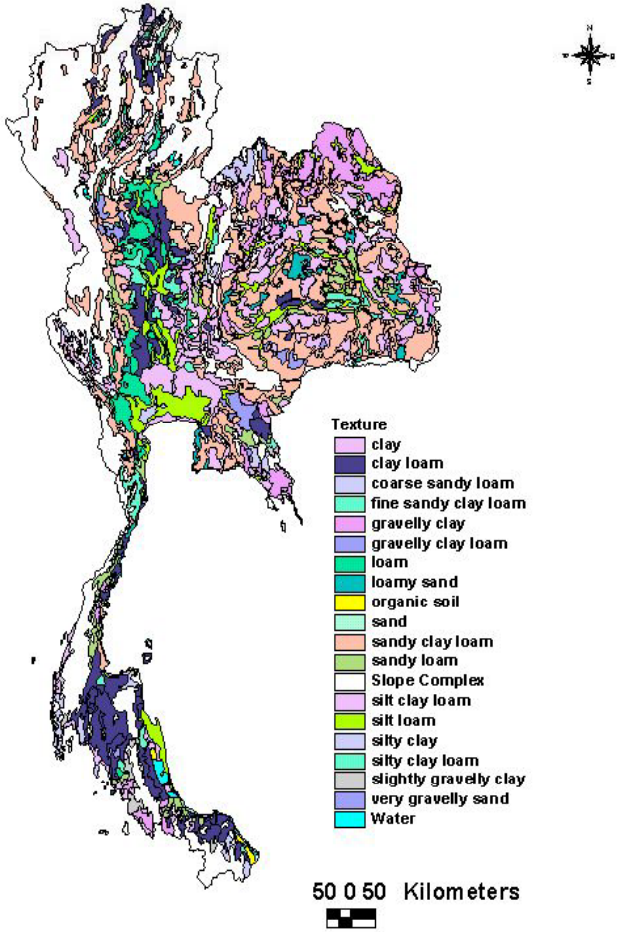

# Irrigation



# Land use


Vietnam
Laos
Thailand
Cambodia
Legend
Countries Boundary
Bush
Forest
Rice
N
0
125
250
500
Kilometers

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National Statistical Office
Ministry of Information and Communication Technology

# 2003 Agricultural Census


- Activity of Holding
- Area of holding by land use
- Area of holding by land tenure
- Livestock
- Rice
- Para rubber
- Major crop
- Fertilizer
- Employment and activity status
- Machinary and equipment
- Dept of holder's household

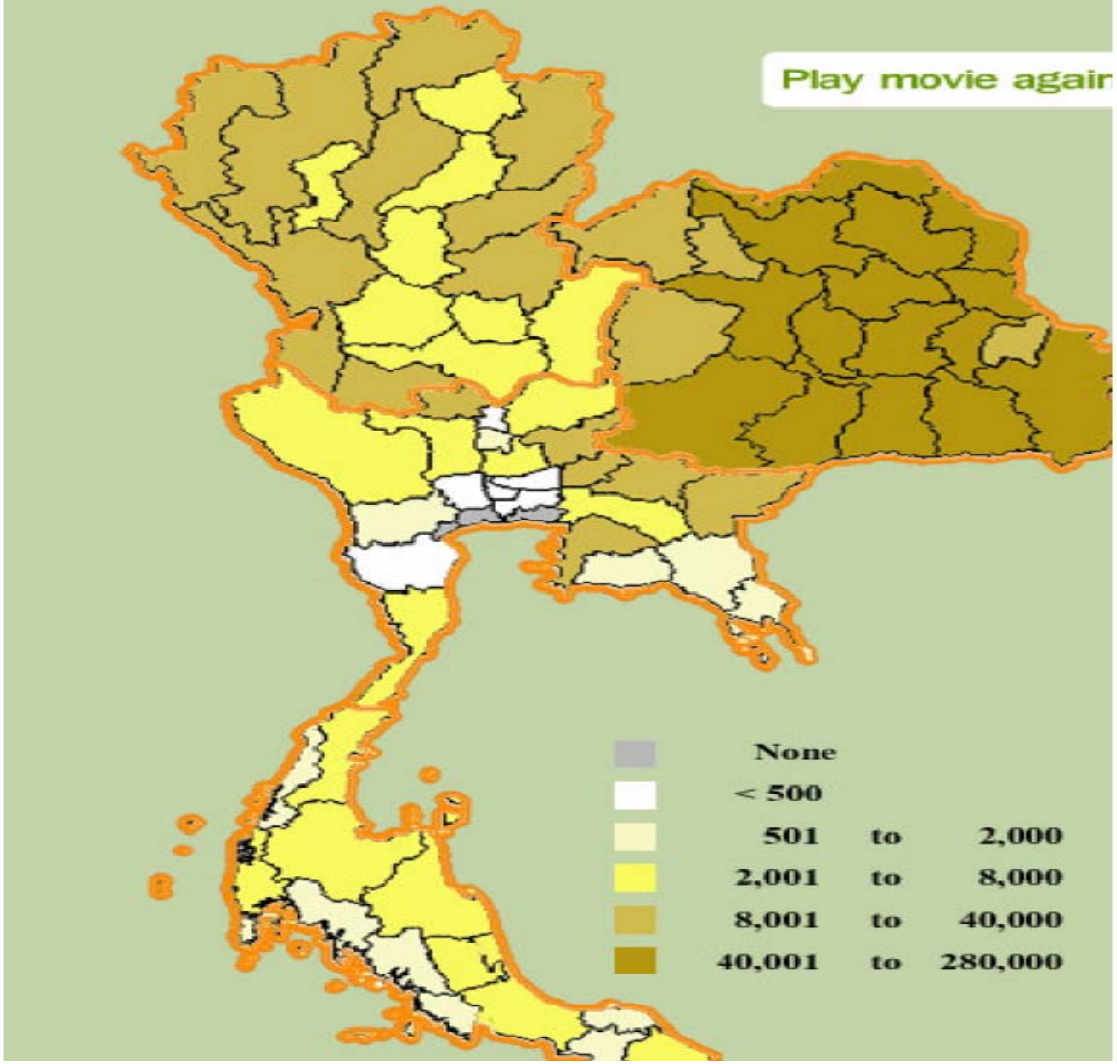
## Back to main page

### Livestock

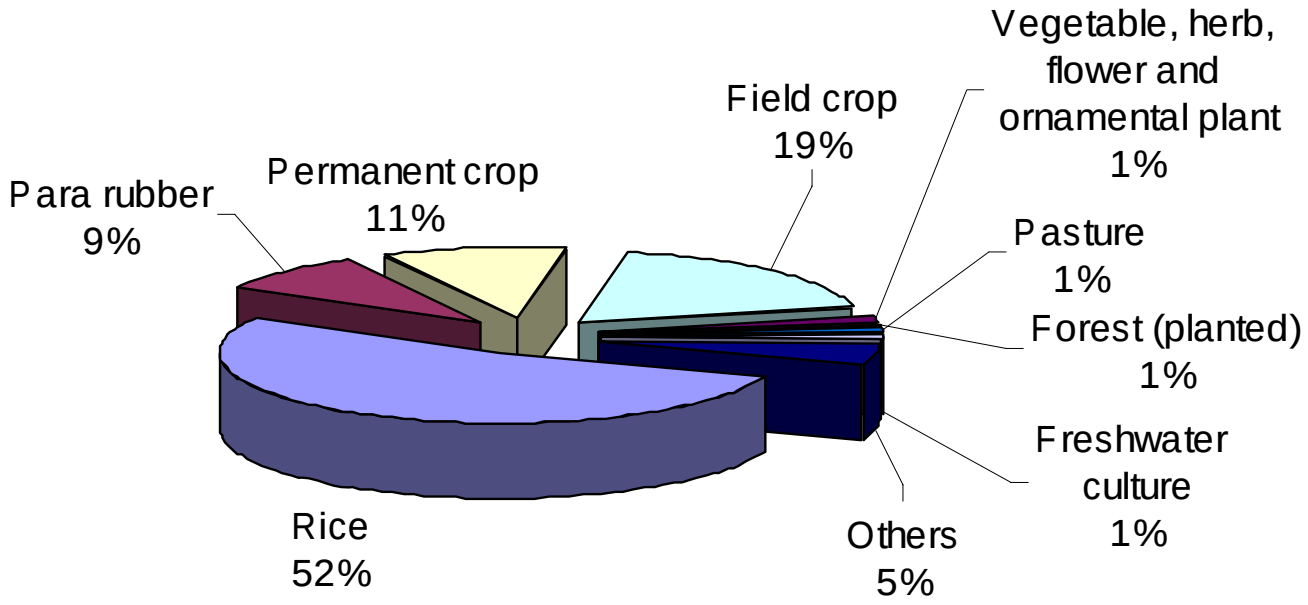
- Number of holding rearing chickens (person)
- Number of chickens of holding (head)
- Number of holding rearing cattle (person)
- Number of cattle of holding (head)
- Number of holding rearing buffaloes (person)
- Number of buffaloes of holding (head)
- Number of holding rearing pigs (person)
- Number of pigs of holding (head)
- Number of holding rearing ducks (person)
- Number of ducks of holding (head)

**Number of buffaloes of holding (head)**

Play movie agair



# Land Use

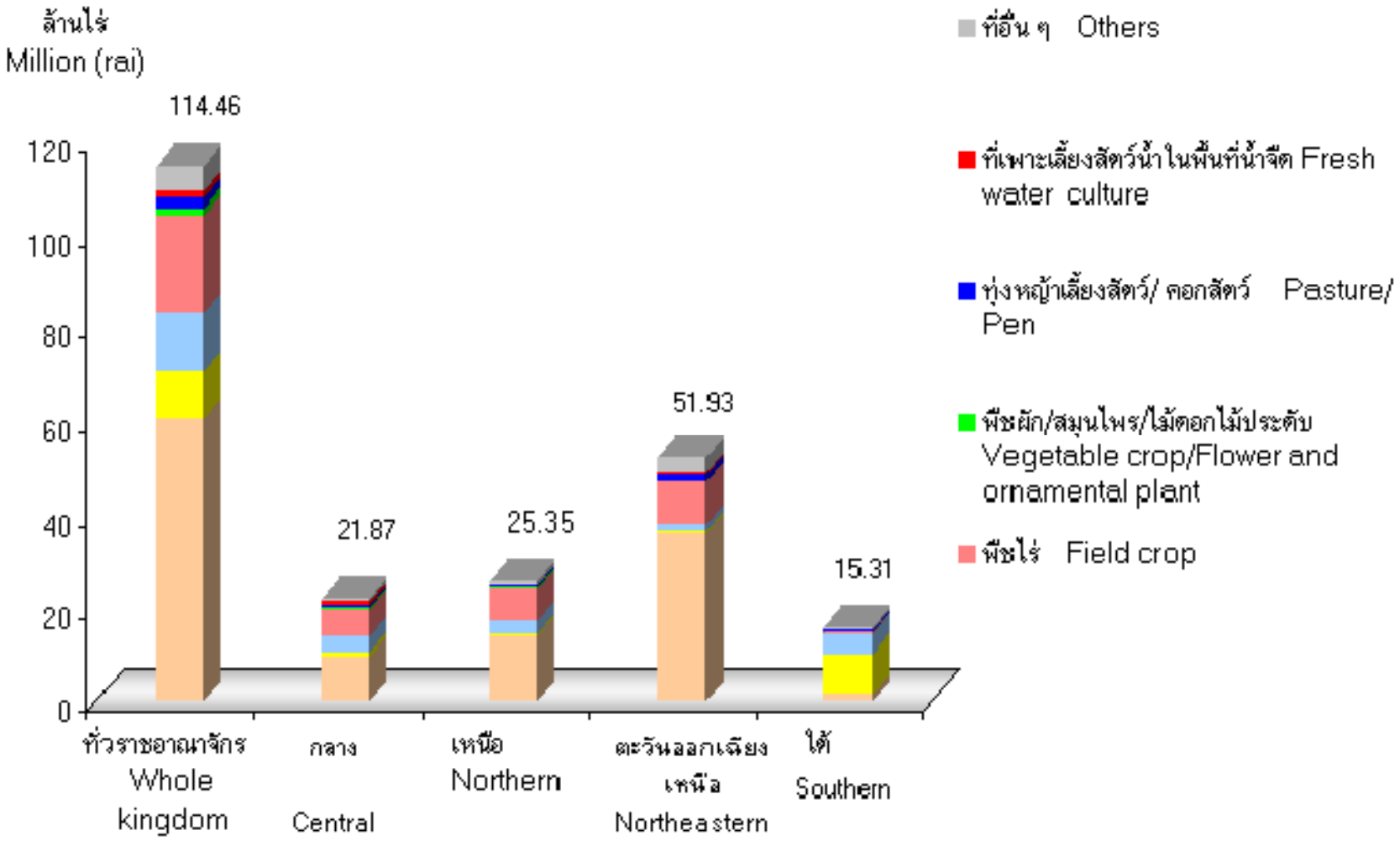



Total area = 19 million ha

# Agriculture Census 2003

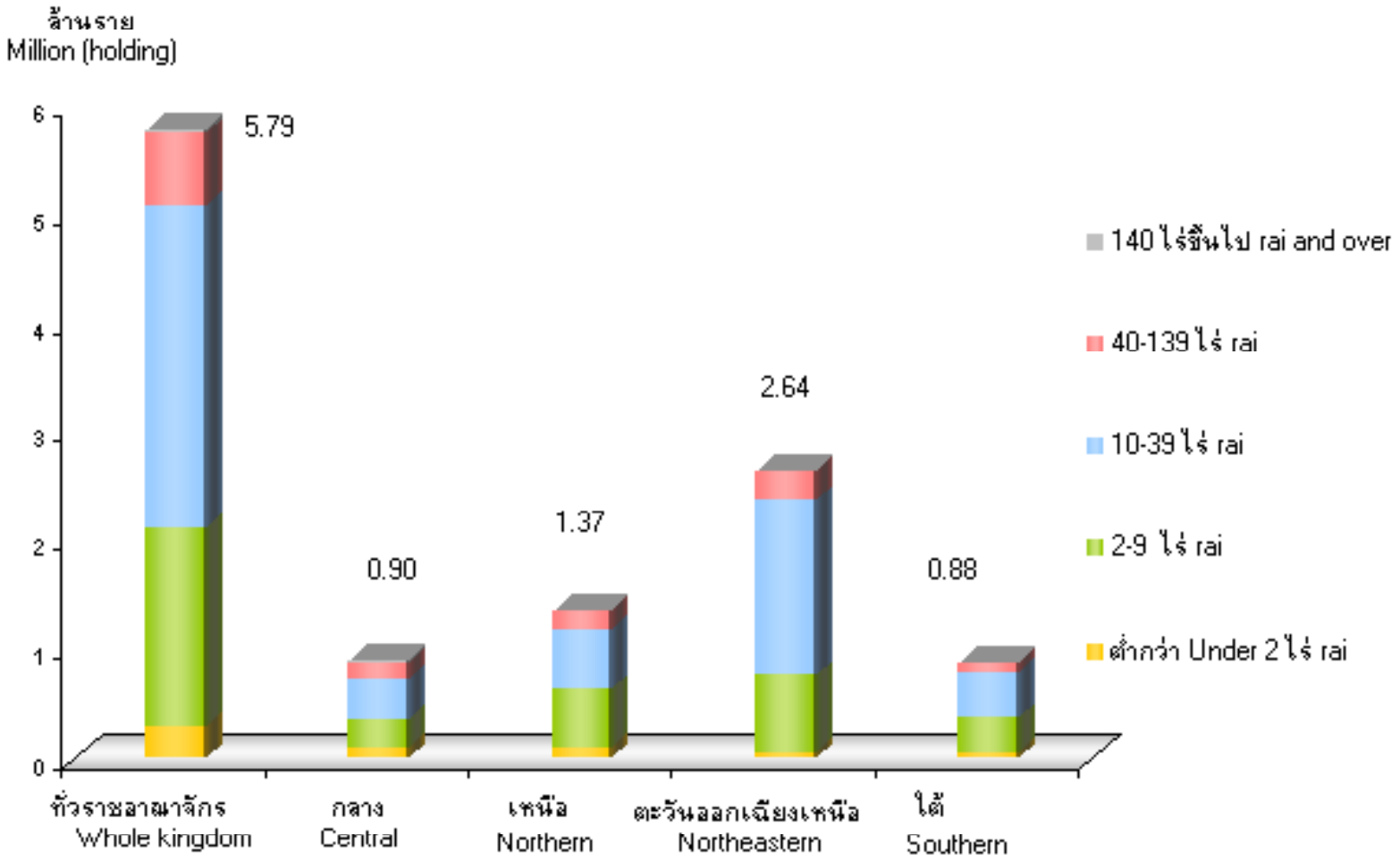
**แผนภูมิ 2 เนื้อที่ถือครองทำการเกษตร จำแนกตามการใช้ประโยชน์ที่ดิน รายภาค**

**Figure 2 Area of holding by land use and region**

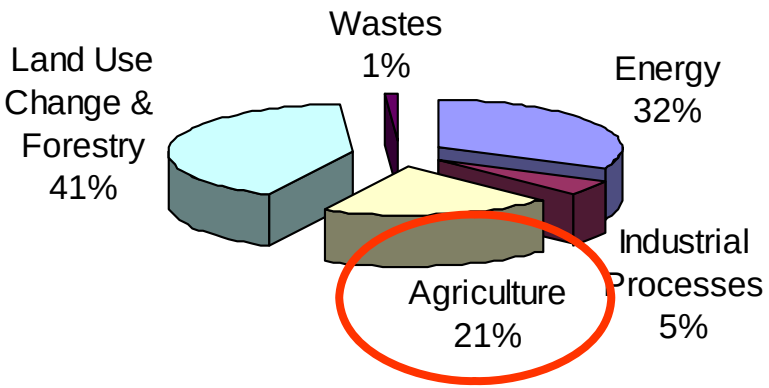


**แผนภูมิ 1 จำนวนผู้ถือครองทำการเกษตร จำแนกตามขนาดเนื้อที่ถือครองทั้งสิ้น รายภาค**

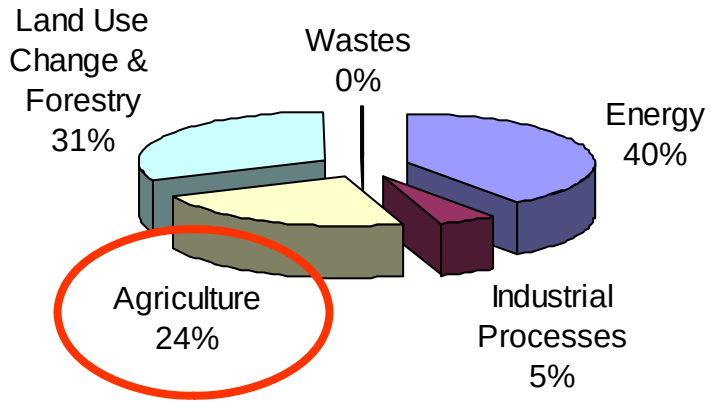
**Figure 1 Number of holdings by size of total area of holding and region**



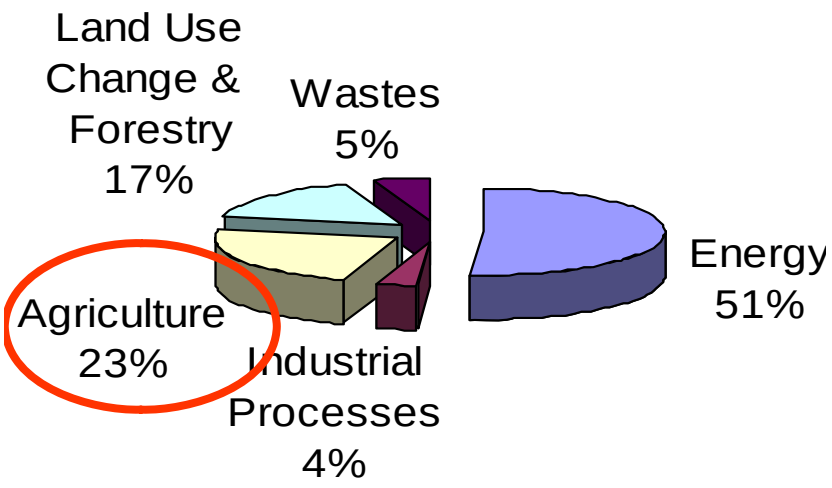
Year 1990: 250 million tons CO2 eq



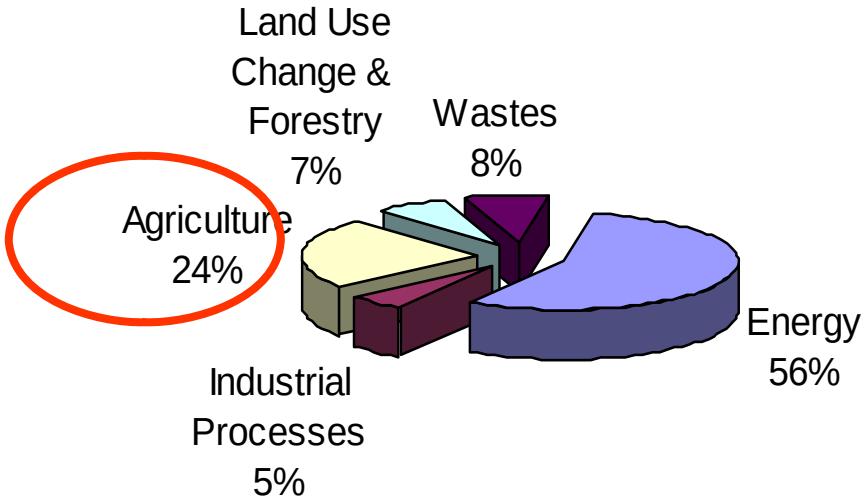

Year 1994: 325 million tons CO2 eq

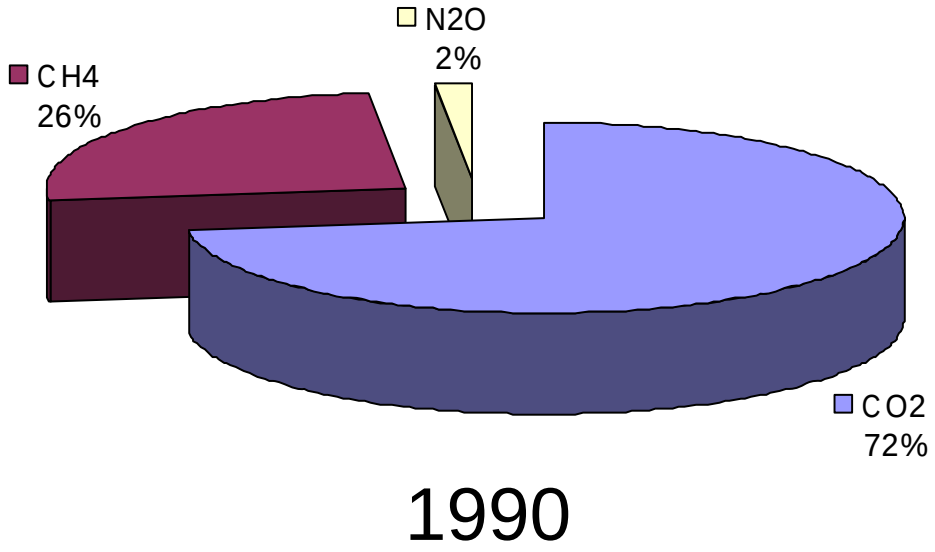



Year 1998: 298 million tons CO2 eq

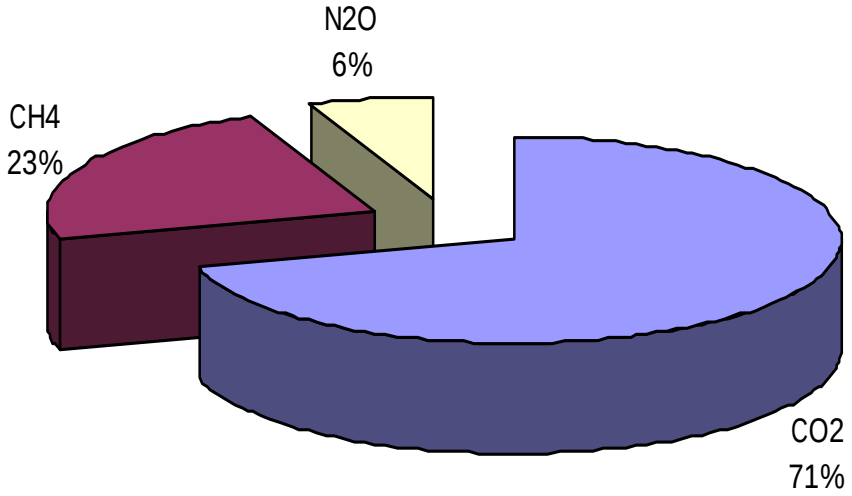



Year 2003: 344 million tons CO2 eq

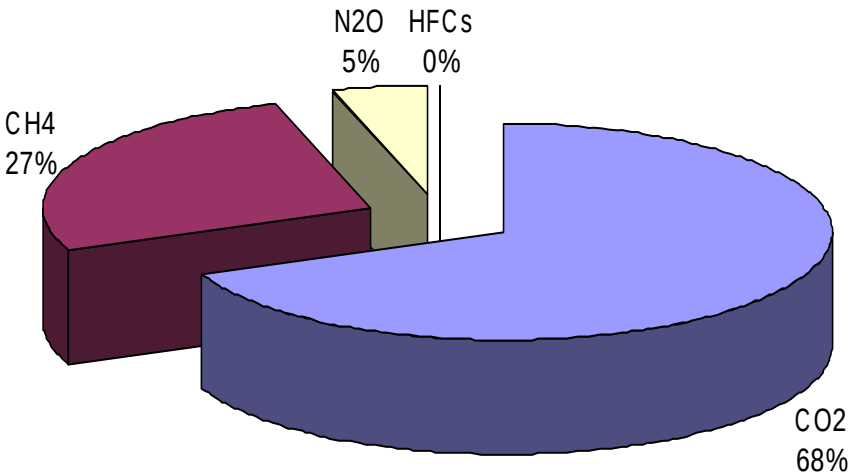




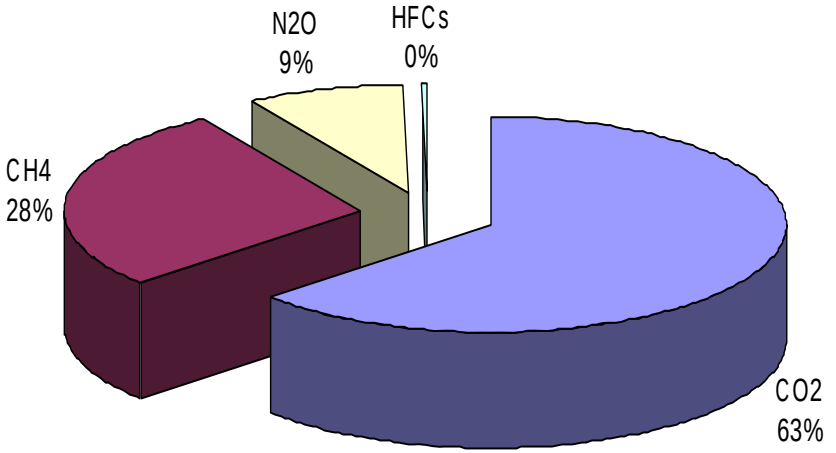

1990




1994

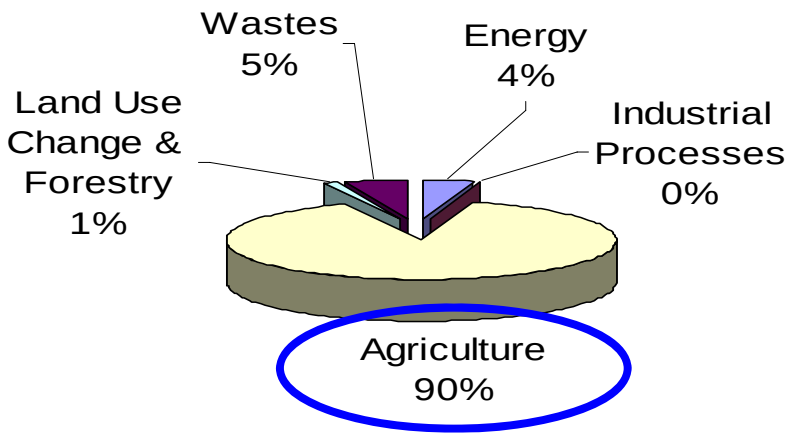



1998

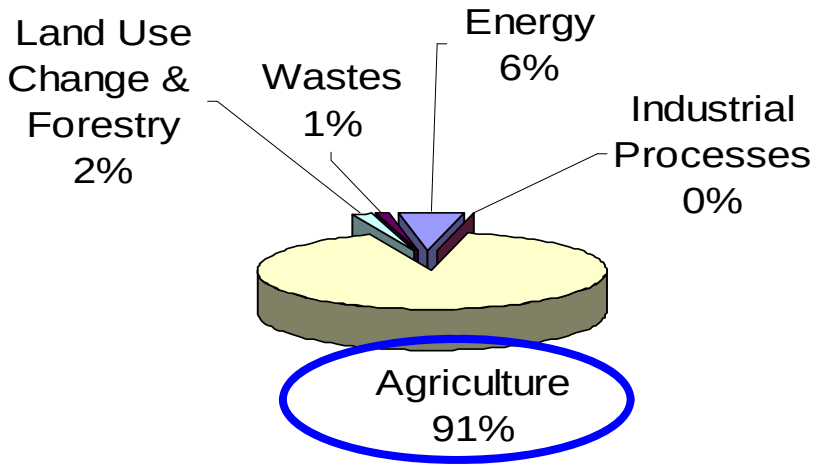



2003

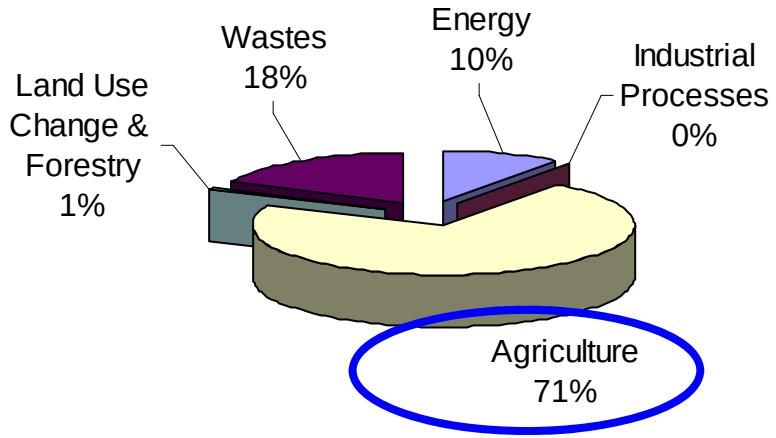
CH4: Year 1990, 58 Mil ton



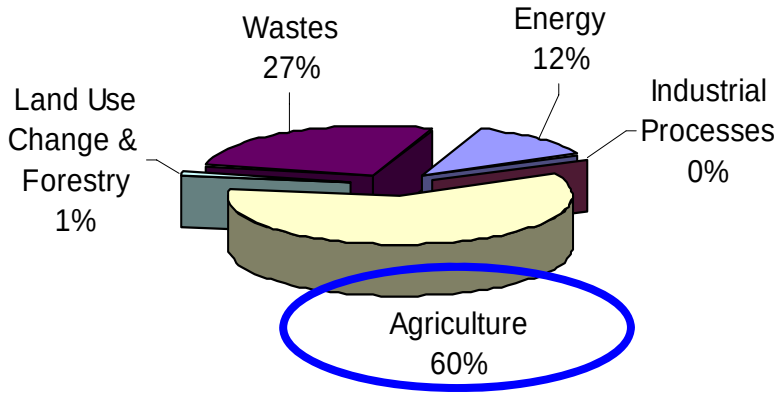

CH4: Year 1994, 67 Mil ton



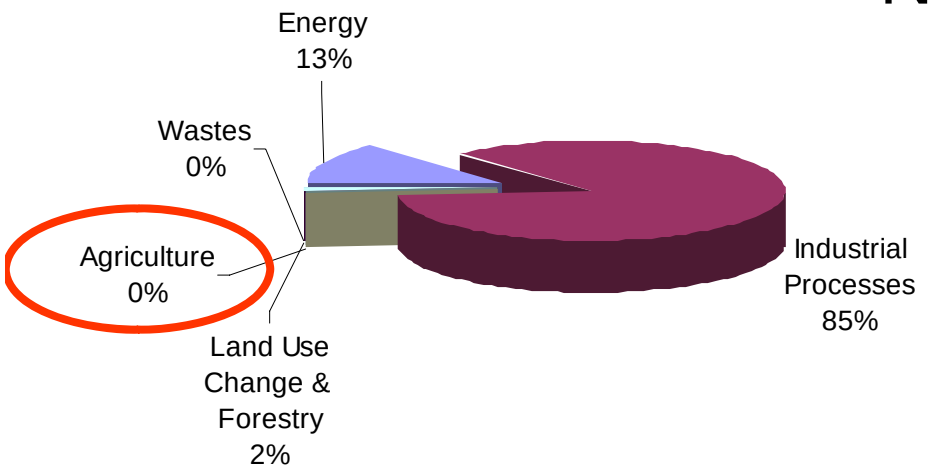

CH4: Year 1998, 80 Mil ton



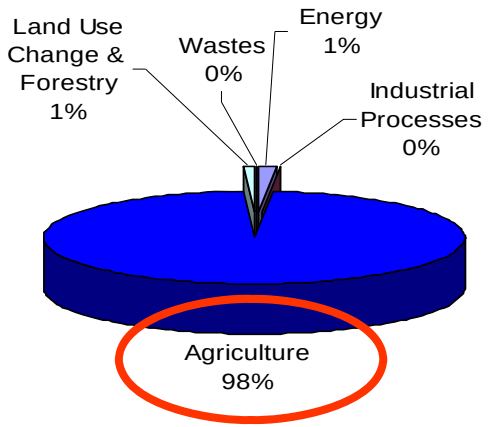

CH4: Year 2003, 95 Mil ton



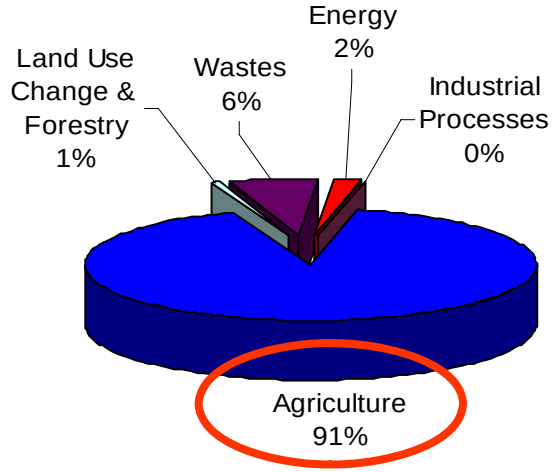
# $N_2O$



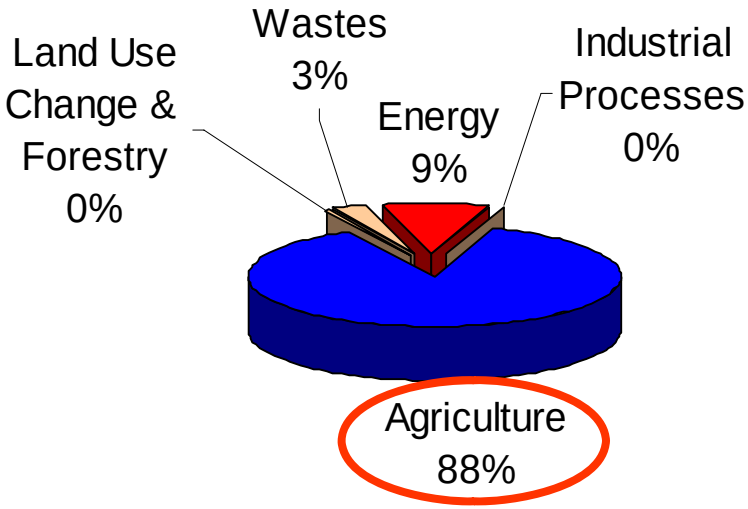

1990, 3.6 Mil ton



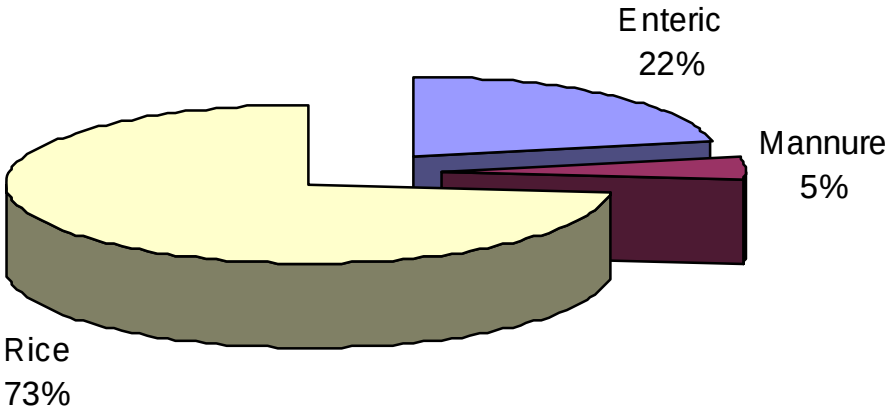

1994, 17 Mil ton



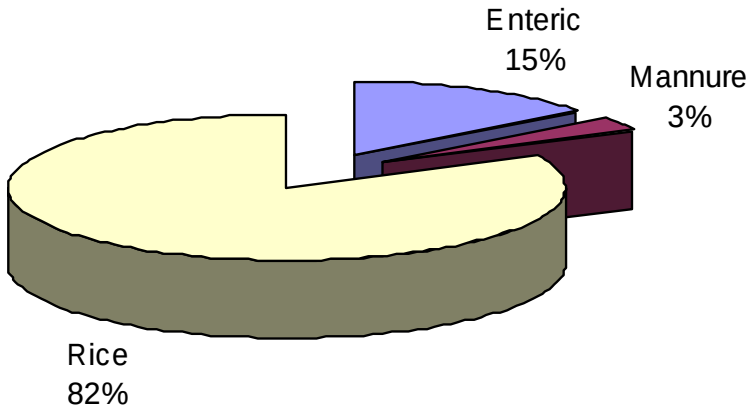

1998, 14 Mil ton




2003, 30 Mil ton

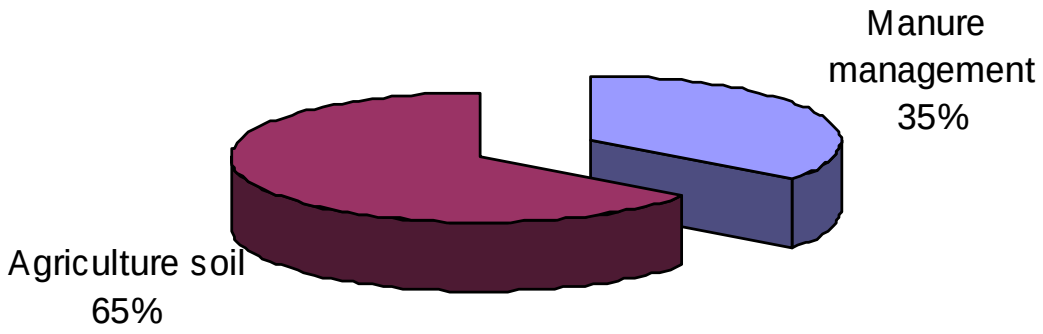



1994



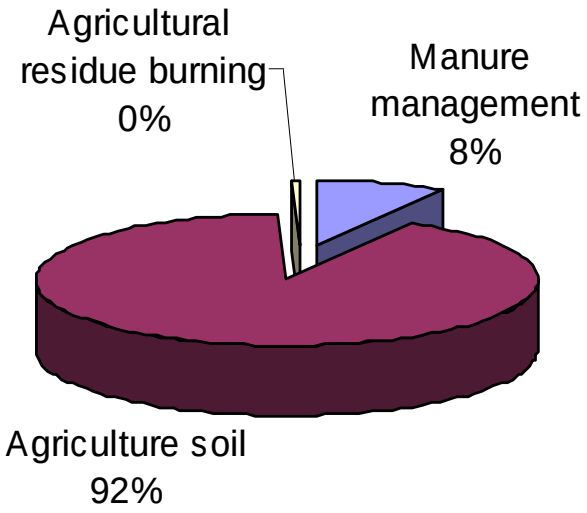

$CH_4$ from Agriculture sector

2003




1994

# $N_2O$ from Agriculture sector




2003

# Thailand KCA

| | *Level Assessment Results* | *Current Year Estimate (Gg $CO_2$ Eq.)* | *Level Assessment (%)* | *Cumulative (%)* |
|---|---|---|---|---|
| 1.A.1 | CO2 Emissions from Stationary Combustion | 45529 | 20.33% | 20.33% |
| 4.C | CH4 Emissions from Rice Production | 44321 | 19.79% | 40.11% |
| 1.A.3 | CO2 Mobile Combustion: Road Vehicles | 39920 | 17.82% | 57.94% |
| 1.A.2 | CO2 Manufacturing Industries and Construction | 30824 | 13.76% | 71.70% |
| 2.A | CO2 Emissions From Cement Production | 14920 | 6.66% | 78.36% |
| 4.A | CH4 Emissions from Enteric Fermentation in Domestic Livestock | 13220 | 5.90% | 84.26% |
| 4.D | N2O (Direct and Indirect) Emissions from Agriculutural Soils | 10983 | 4.90% | 89.17% |
| 4.B | N2O Emissions from Manure Management | 5949 | 2.66% | 91.82% |
| 1.A.4 | Other Sectors: Agriculture | 4849 | 2.16% | 93.99% |
| 1.B.2 | CH4 Fugitive Emissions from Oil and gas Operations | 3731 | 1.67% | 95.65% |

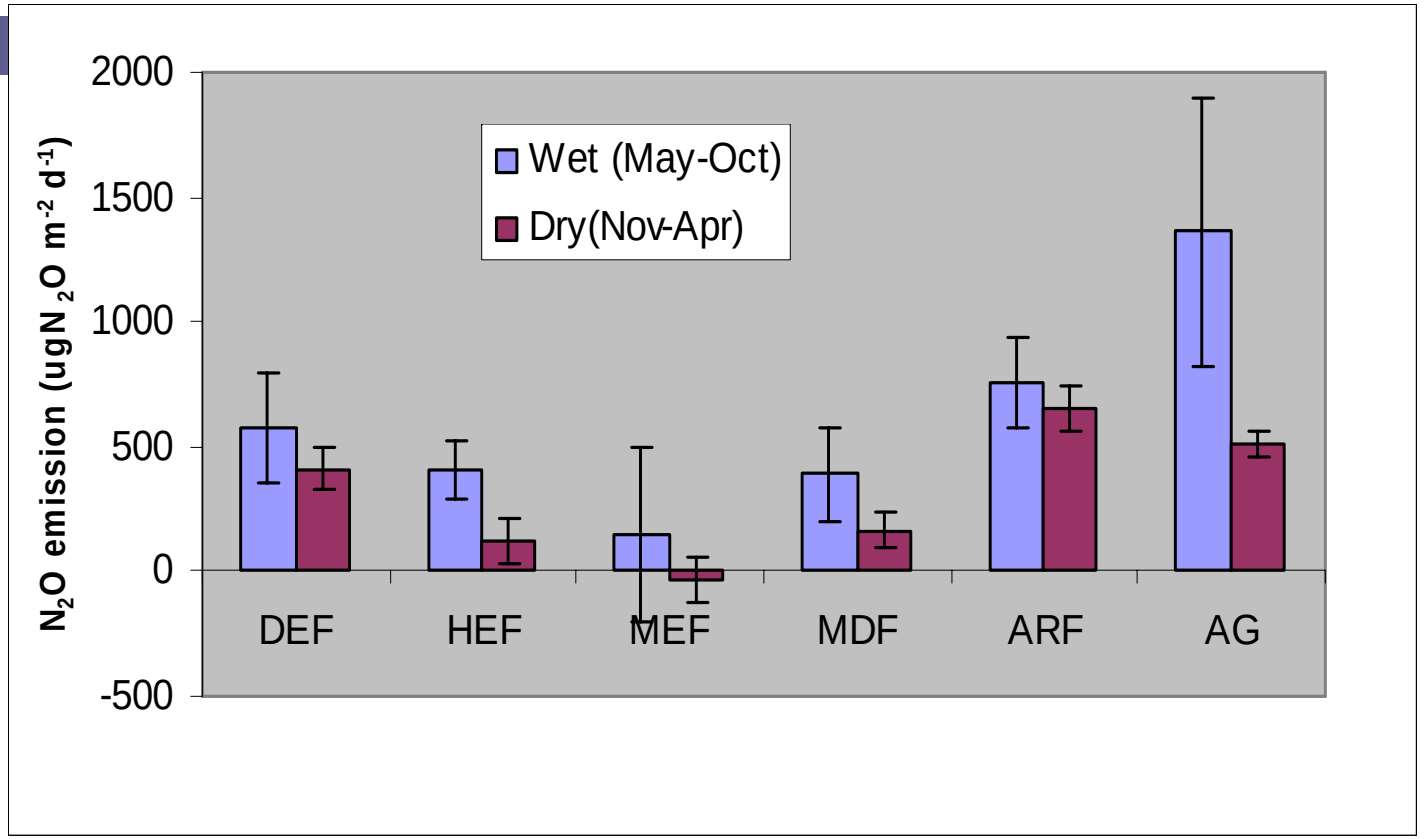
# LULUCF

| *LULUCF Level Assesment Results (LULUCF Category Key Sources Only)* | *Current Year Net Estimate (Gg $CO_2$ eq.)* | *LULUCF Level Assessment (%)* |
|---|---|---|
| CO2 from conversion to Cropland | 59,396.84 | 16.33% |
| CO2 emission from Wood and fuel wood consumption | 40,180.51 | 11.05% |
| CO2 removals from changes in forest and other woody biomass stocks | \|-39,101.60\| | 10.75% |

# Additions in SNC

- Emission factor
- KCA
- QA/QC
- Agricultural residue burning

# $N_2O$ flux




| The monthly average (±SD) ($\mu g\ N_2O\ m^{-2}\ day^{-1}$) | |
|---|---|
| DEF | 491±321 |
| HEF | 261.9±268 |
| MEF | 46±456 |
| MDF | 276±321 |
| ARF | 627±346 |
| AG | 829±851 |

## Thailand

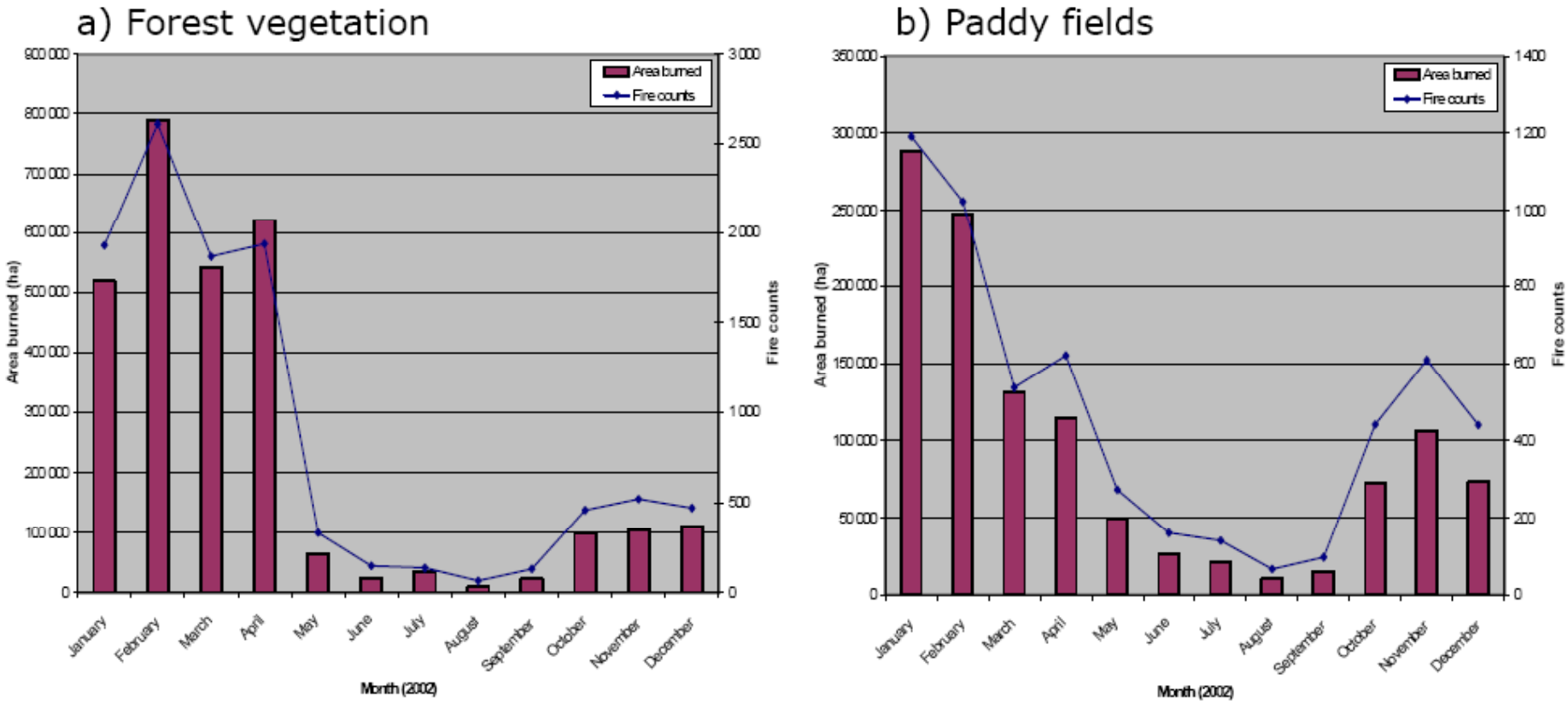
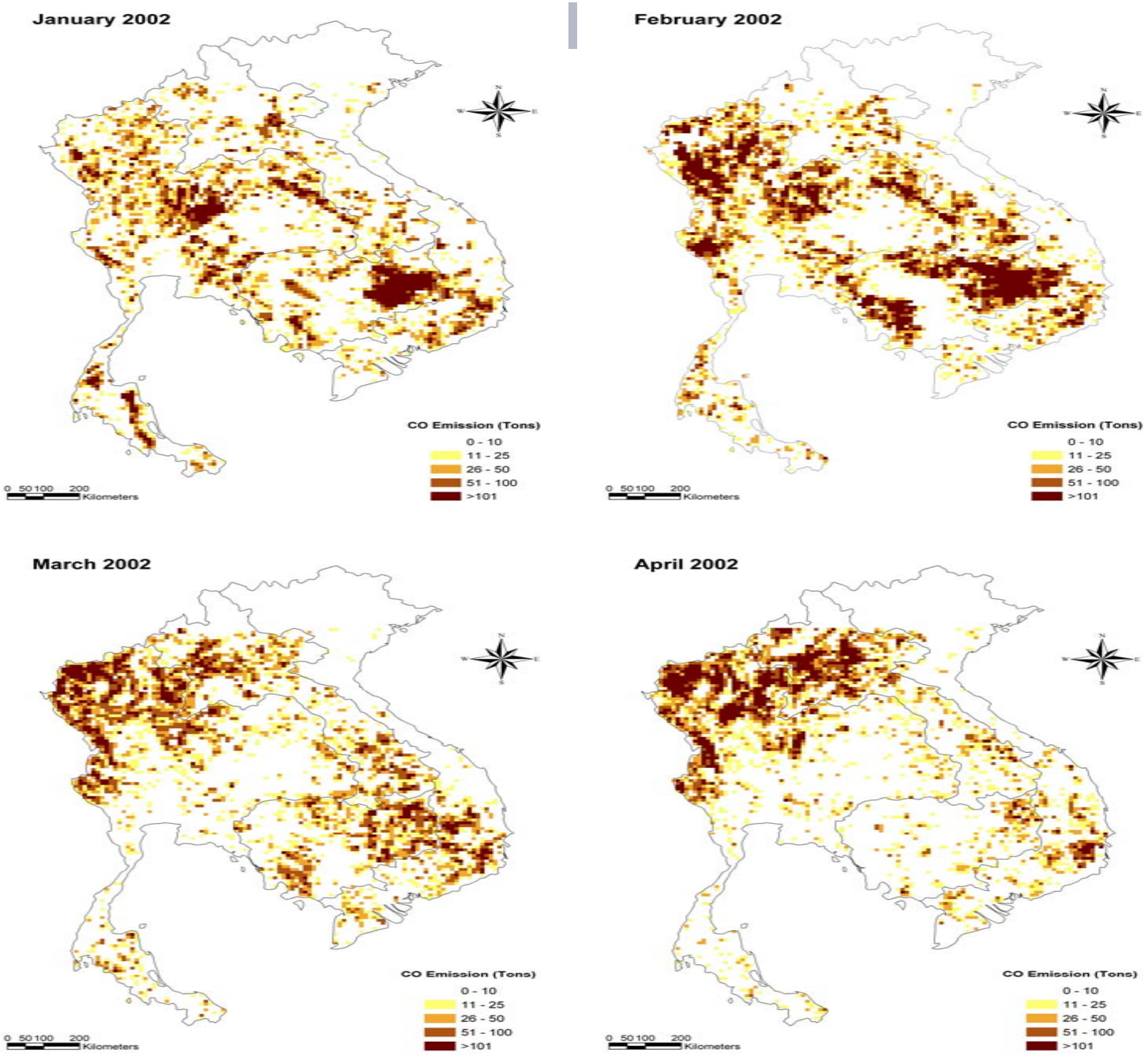
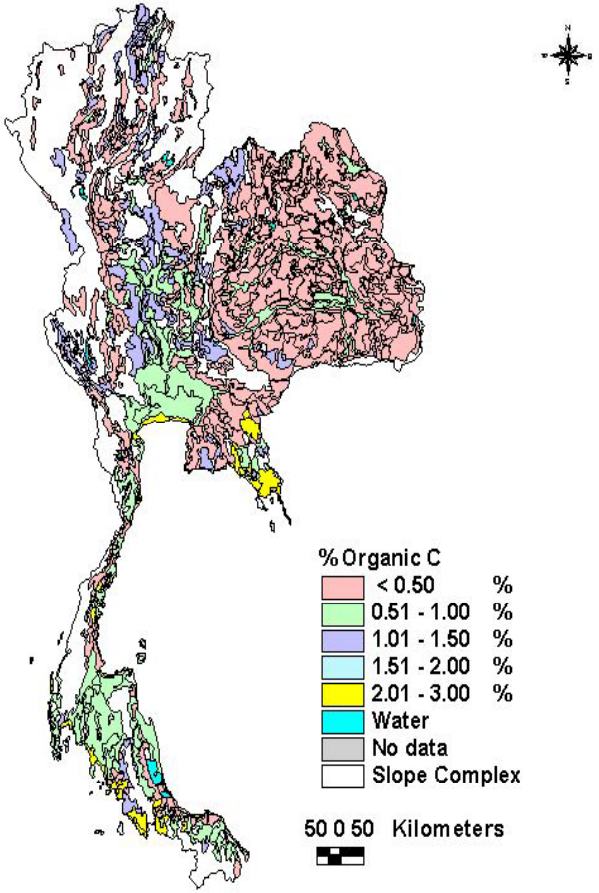


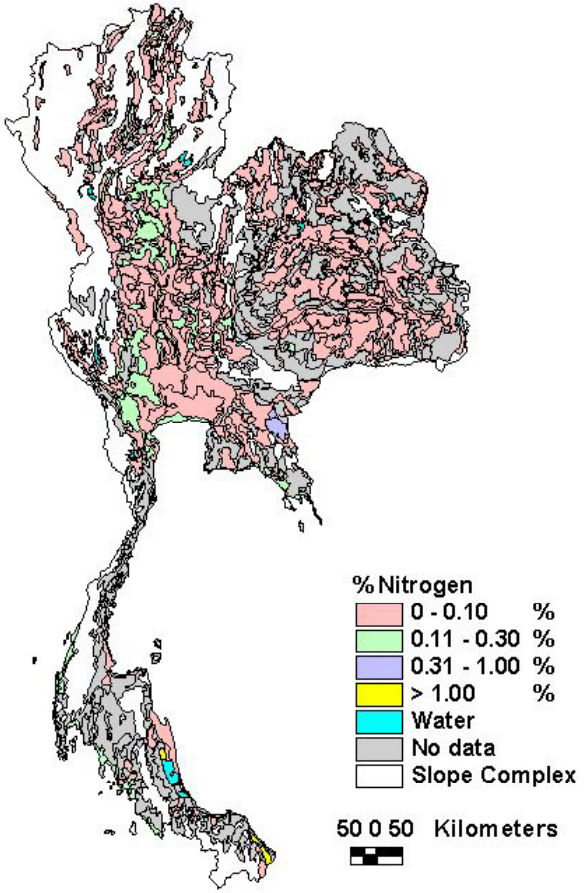

**Figure 2.** Monthly Fire counts and corresponding area of biomass burned in Thailand during 2002 for a) forest vegetation, and b) paddy fields

Towprayoon et al. 2007



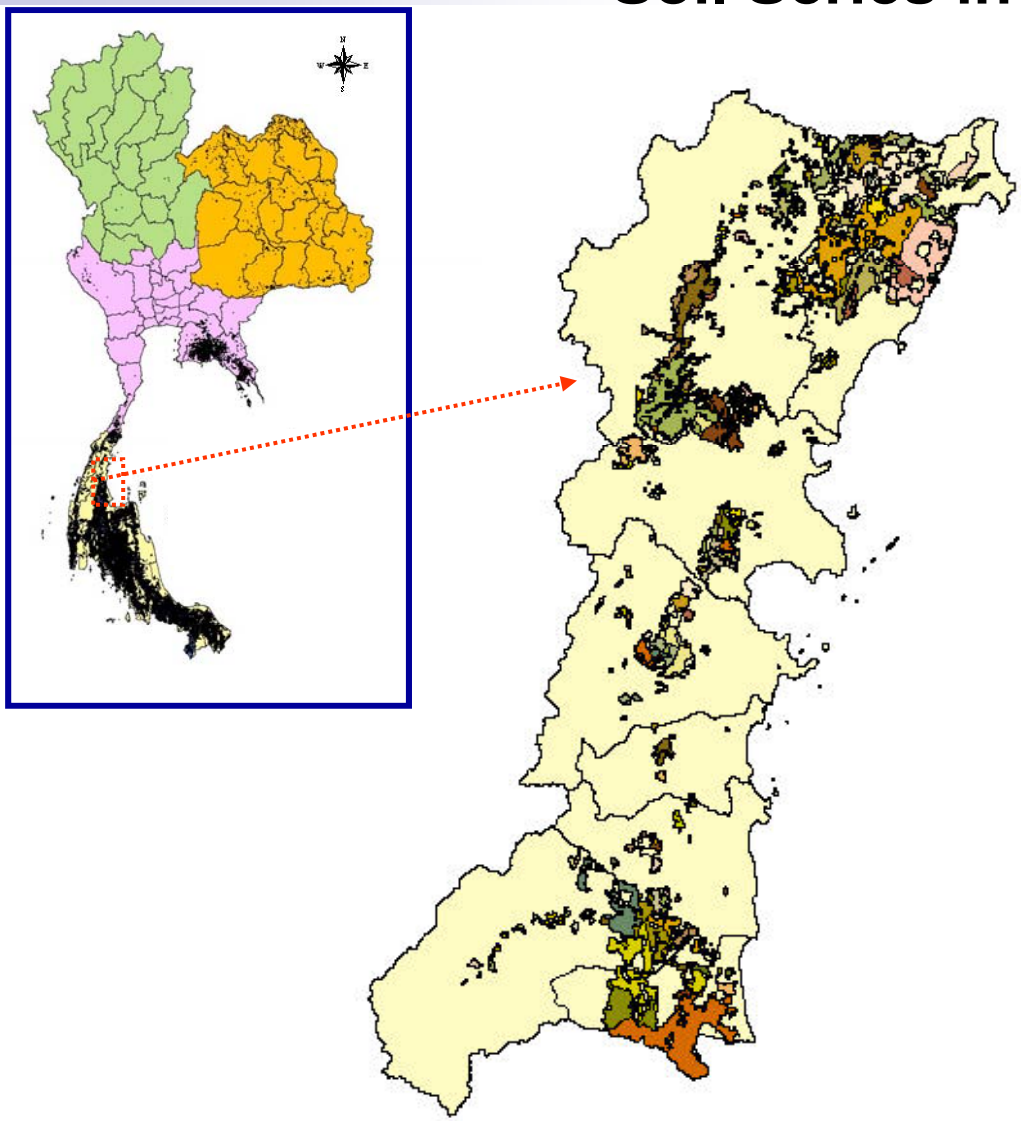

Towprayoon et al. 2007




Towprayoon et al. 2005

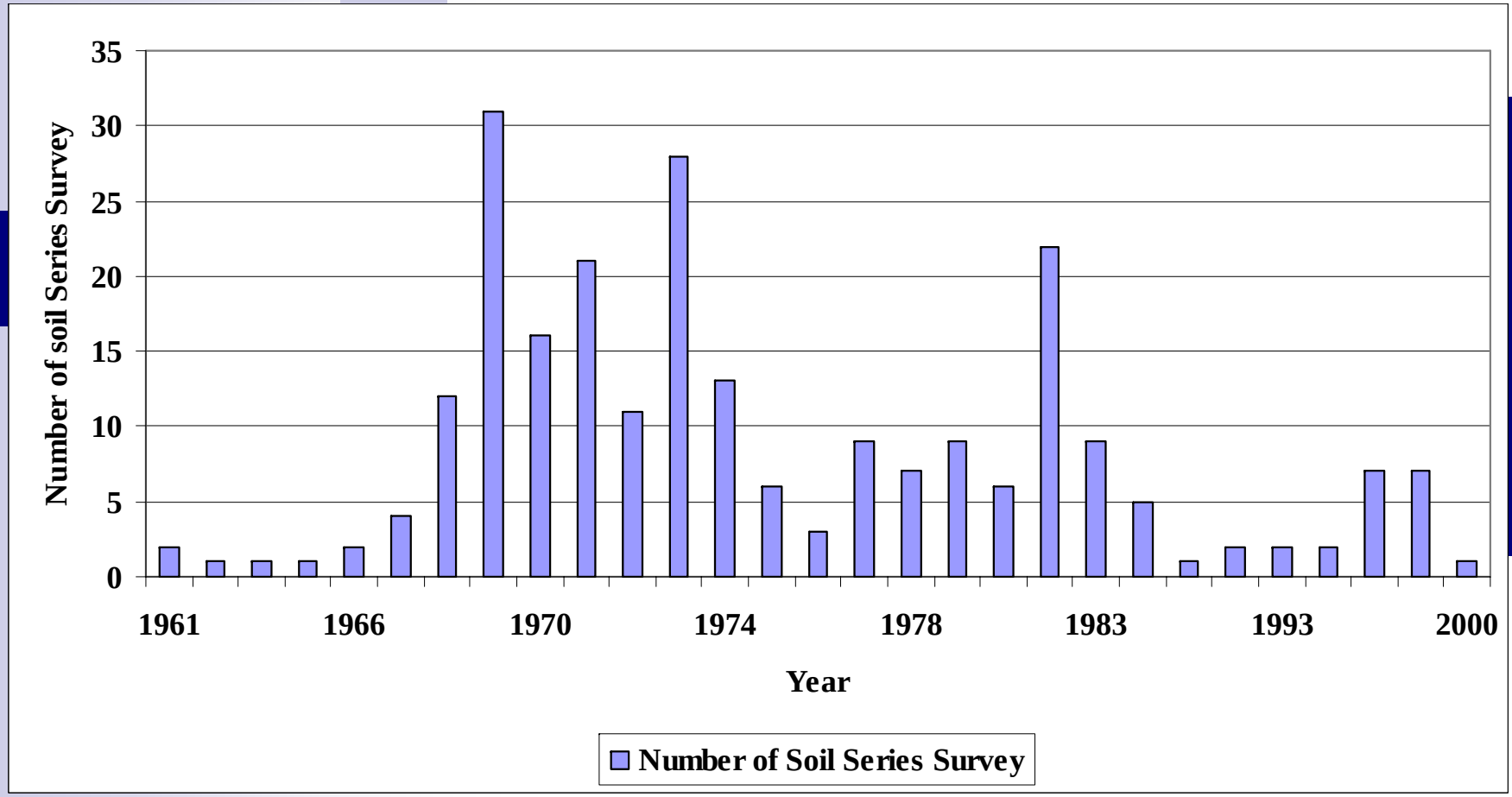
# Soil Series in Rubber Tree Plantation Area



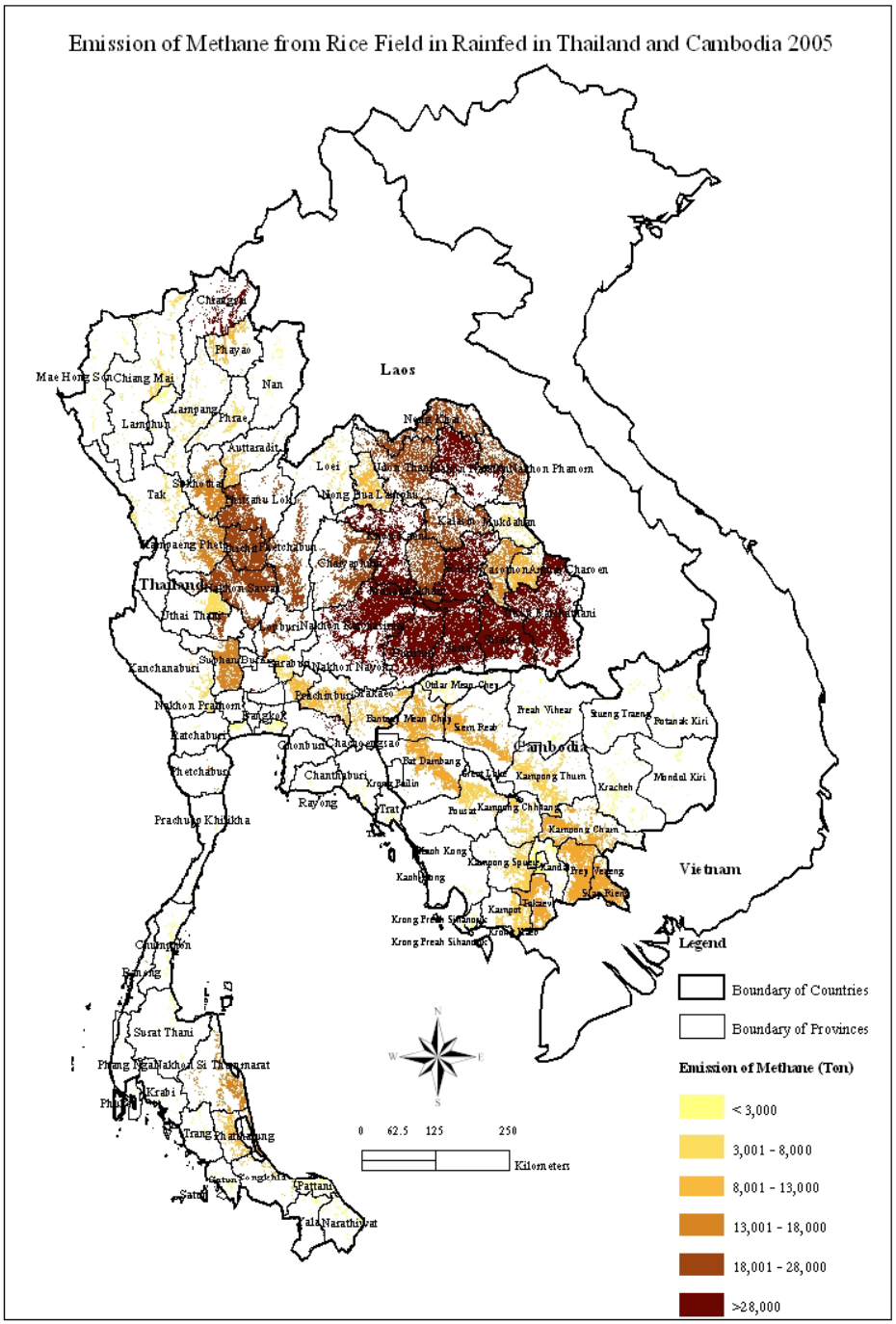
| No. | Soil series | Area ($m^2$) |
|---|---|---|
| 1 | AC | 1,163,183.76 |
| 2 | Ak | 11,395,951.20 |
| 3 | Ba | 10,673,272.00 |
| 4 | Beach | 3,579,335.50 |
| 5 | Bh/Wpry | 135,499.76 |
| 6 | Bp-gy | 628,795.10 |
| 7 | Cb | 1,764,090.50 |
| 8 | Cb-hi | 7,692,489.42 |
| 9 | Cp | 183,923,713.22 |
| 10 | Hh | 902,842.62 |
| . | | |
| . | | |
| . | | |
| 51 | Wp | 318,585.56 |
| | Total | 2,009,939,294.52 |

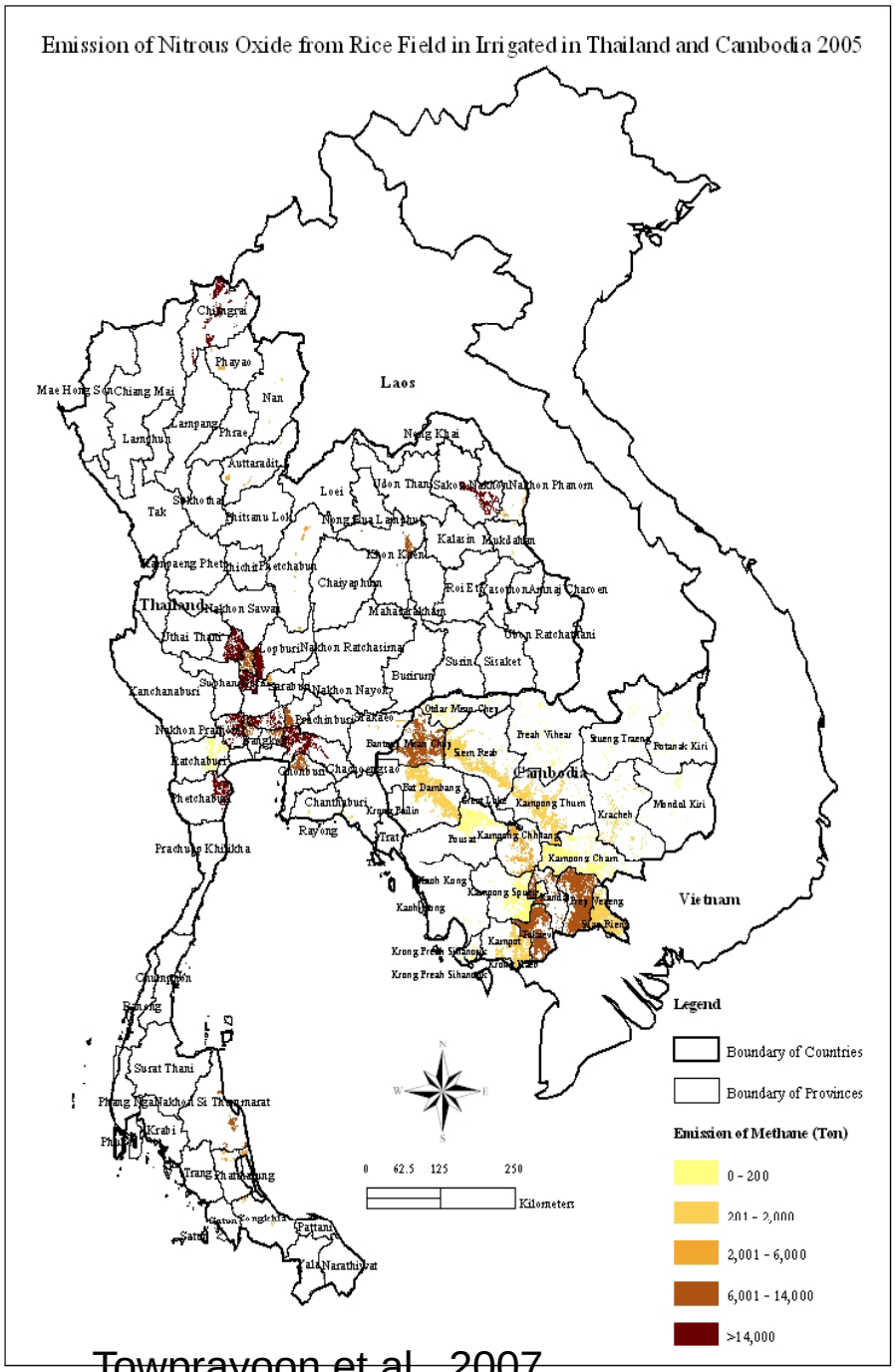
Pechsri et al., 2007

# Year of Soil Series Survey

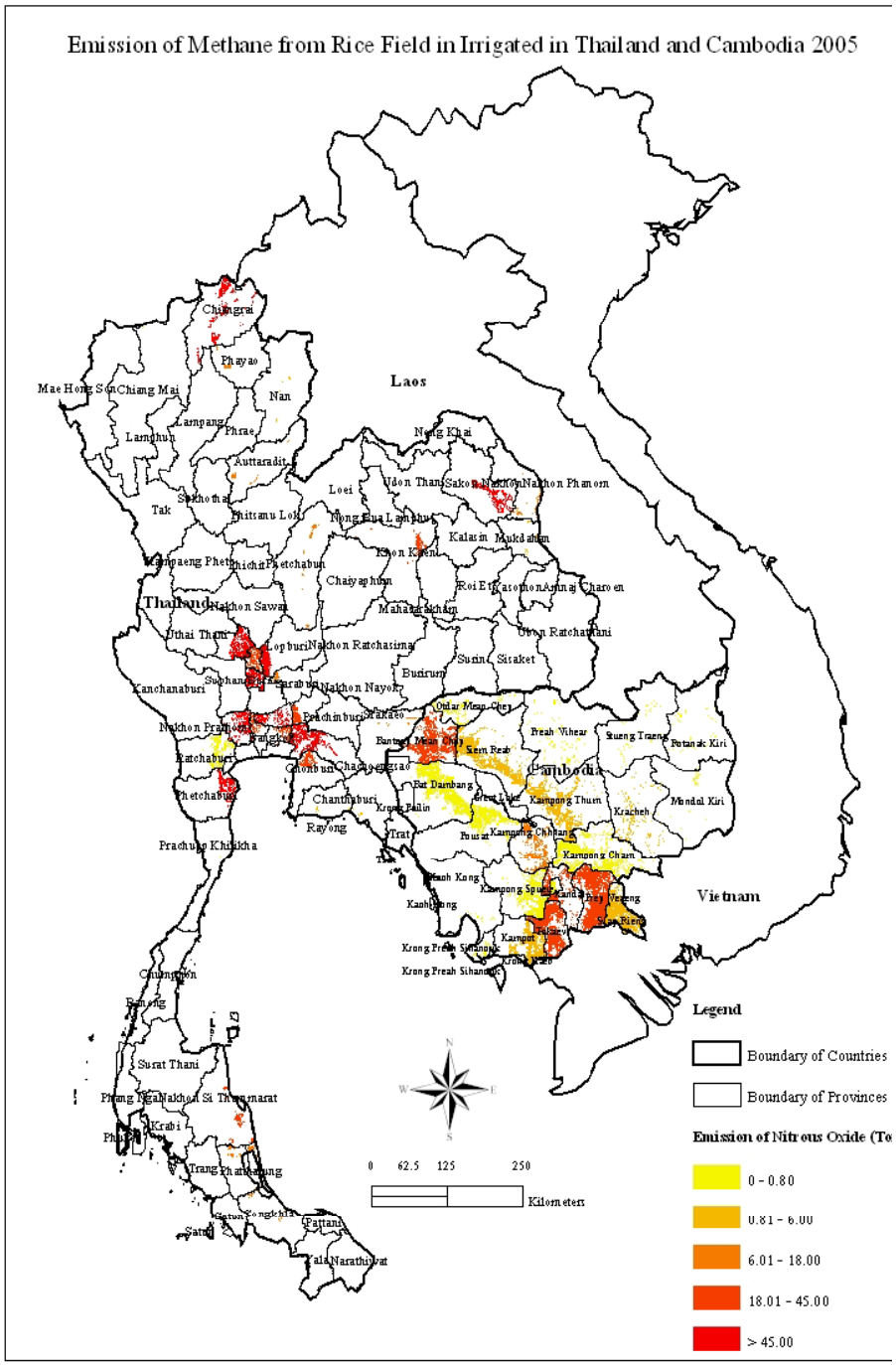


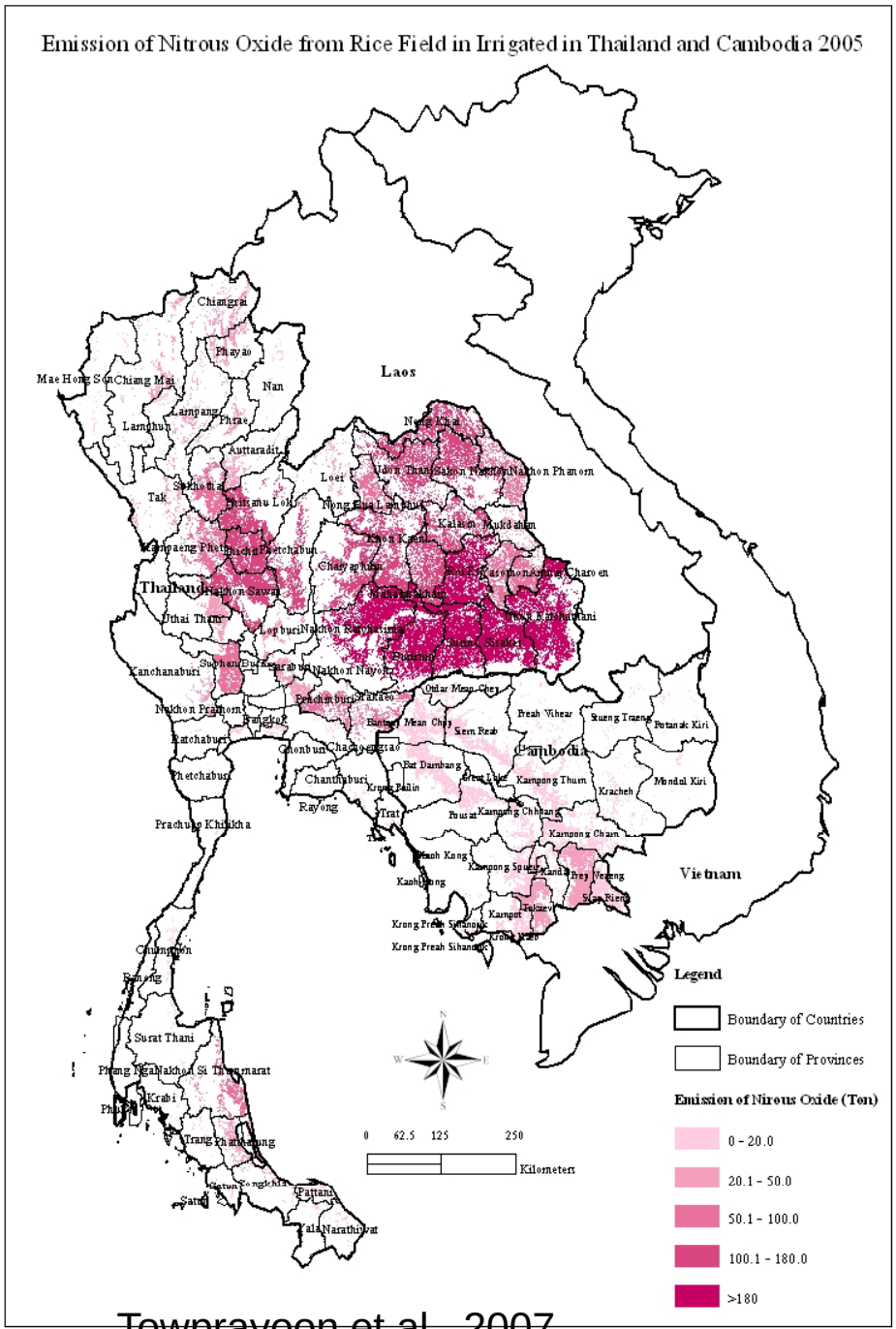

Pechsri et al., 2007




Towprayoon et al., 2007




Towprayoon et al., 2007

# Conclusions

- Agriculture is the second most important sector as greenhouse gas emission source
- Main gas is $CH_4$ (>80% of total $CH_4$ emission in 2003)
- Also the main $N_2O$ sources (livestock & manure management)