



# INDONESIA'S 'GREEN AGRICULTURE' STRATEGIES AND POLICIES: CLOSING THE GAP BETWEEN ASPIRATIONS AND APPLICATION

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Workshop on Measuring Sustainable  
Agriculture, Food Security and Poverty  
Alleviation for Enhancing Accountability  
in the Post-2015 Development Agenda

a [CGIAR Consortium Research Centre](http://www.cgiar.org).

Headquarters are in Nairobi, Kenya, with five regional offices located in Cameroon, India, Indonesia, Kenya and Peru.

**Vision:**

**A rural transformation** in the developing world as smallholder households strategically increase their

**use of trees** in agricultural landscapes to improve their food security, nutrition, income, health, shelter, social cohesion, energy resources and environmental sustainability.

**Mission:** to generate **science-based knowledge** about the diverse roles that trees play in agricultural landscapes, and to use its research to advance policies and practices, and their implementation, that benefit the poor and the environment.



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## Where We Work

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## Where we work

The World Agroforestry Centre operates five Regional Programmes through a Regional Network Office as follows:

- [East and Southern Africa](#) (with two subregions in [East Africa](#) and [Southern Africa](#))
- [Latin America](#)
- [South Asia](#)
- [Southeast Asia](#)
- [East And Central Asia](#)
- [West and Central Africa](#) (with two subregions in Humid and Semi-Arid areas)

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### Where we work

- East and Southern Africa
- Latin America
- South Asia
- Southeast Asia
- East and Central Asia
- West and Central Africa

### Our research

- Agroforestry systems
- Tree products and markets
- Tree diversity, domestication and delivery
- Land health
- Environmental services
- Climate change

### CGIAR research

CGIAR Research Programme 6, Forests, Trees and Agroforestry (CRP6)  
 CGIAR Research Program 7 - Climate Change, Agriculture and Food Security (CRP7) (CCAFS)

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# Introduction

- Overview of the state-of-art of Green Agriculture
  - *Oil Palm, Coffee, Cacao, Rubber, and Rice*
- **Green Agriculture:** *A way to pursue agricultural growth, while preventing environmental degradation, biodiversity loss and unsustainable natural resource use ... (OECD)*



Challenges

Aspirations

Applications

Capacities

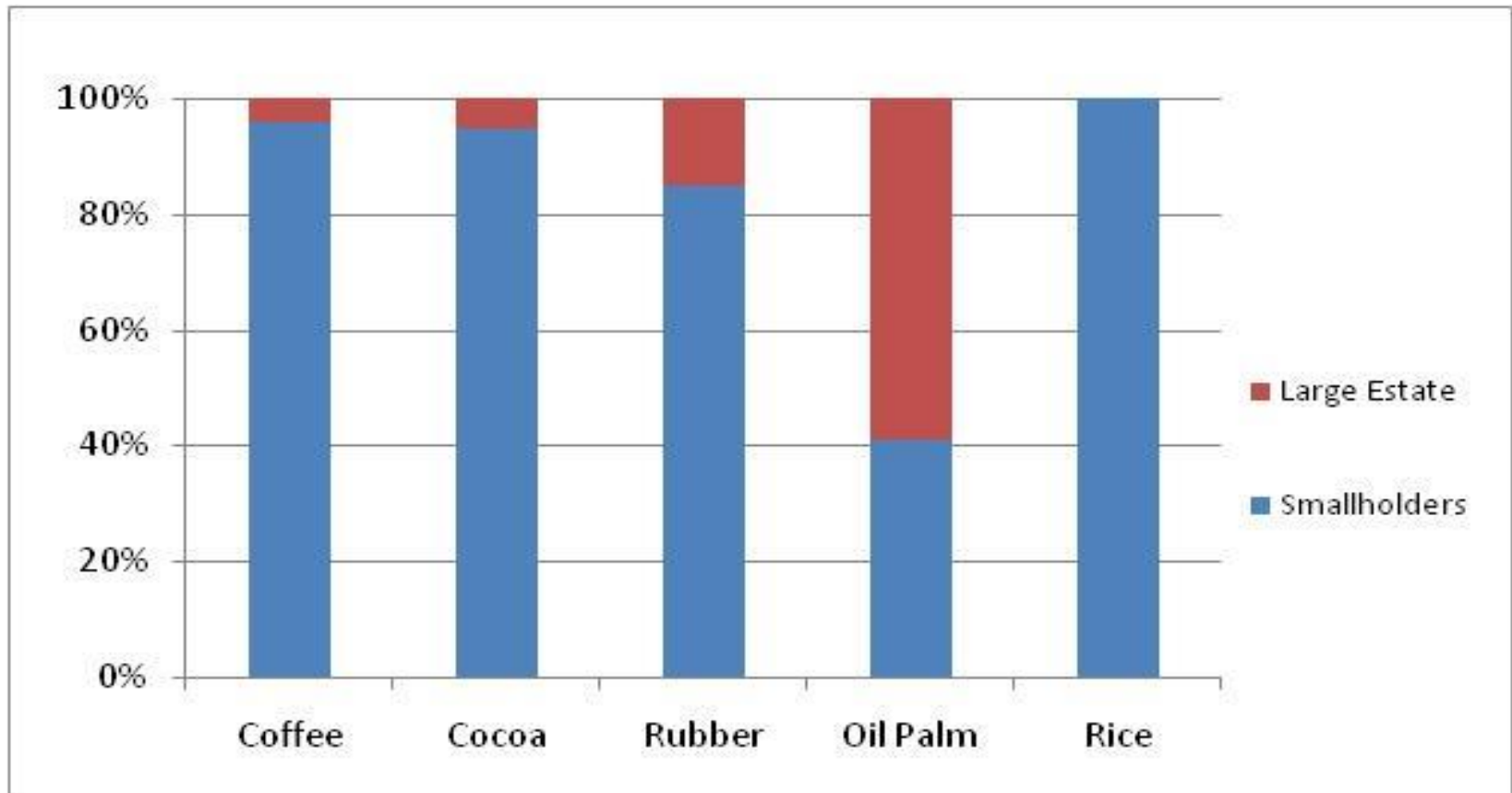
**Improving GA:**

- Remaining gaps
- Future Catalyst
- Government Measures

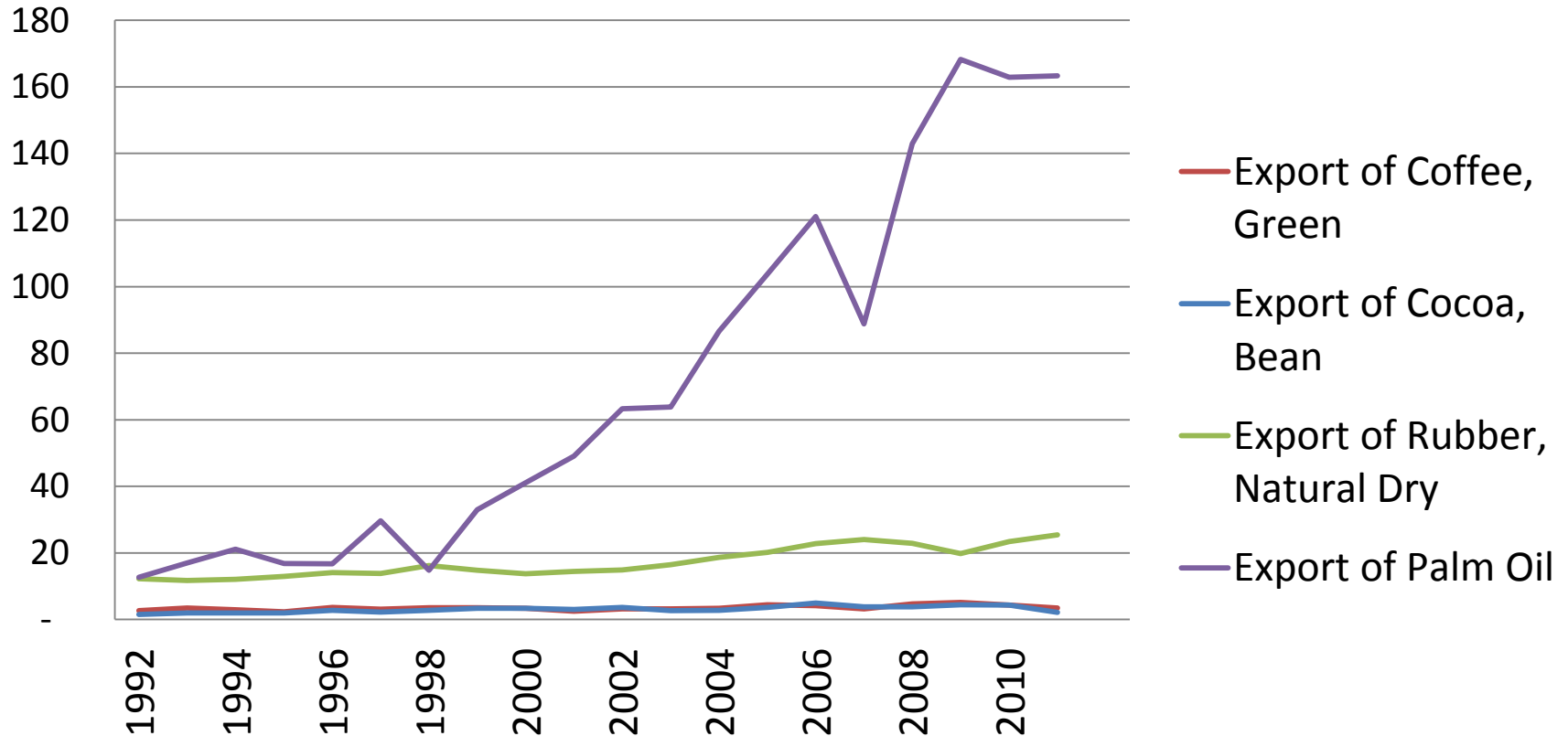
# Centre of Production in 2013



# Share of land under production in 2012 by type of farm (BPS, 2014)



# Export quantity of commodity 1992-2010 in hundred Tons (FAO, 2013)



# A. Challenges

## *Deforestation and forest conversion*

- Expansion of large-scale monoculture plantations
- Clear cutting timber operations

## *Habitat conversion and biodiversity loss*

- Intensive monoculture practices in protected areas
- Discontinued vegetative cover in the HCV

## *Land degradation and erosion*

- Poor site selection such as loose soil and steep slope
- Lack of Good Agricultural practices

## *Decreasing carbon stocks and Increasing GHG emissions*

- Large scale conversion originated from natural habitats
- Persistent flooding of irrigated rice cultivation
- Excessive use of synthetic fertilizers
- High-yielding rice varieties producing higher emission

## *High water footprint*

- Vary among commodities and processing

## *Air and water pollution*

- Slash-and –burn particularly in dry season
- Commodity processing, particularly latex rubber processing and palm oil mill
- Inefficient use of synthetic fertilizer



# 1 Natural forest conversion to agriculture

- Area under smallholder coffee expanded from the 1970s through to the early 2000s and cacao in early 1980
- Conversion of sun coffee into simple and complex shade coffee systems improving watershed functions about 70 percent of the natural forests
- Not converted from primary forests but rather from older agroforestry-based farms containing coffee and assorted fruit trees, and former annual-crop
- Forest conversion was dominated by tree clear-cutting operations by the timber industry



# 1 Natural forest conversion to agriculture

- Oil palm plantations dominated by large-scale corporations
- Contributing to 16-29 % deforestation rate (Fitzherbert et al 2008; Uryu et al 2008)
- Dominating by the land-use planning violations, tenure conflicts, volatile to corruptions
- Decentralization influencing permits published for new plantation
- 10 of 23 oil palm plantations: 60% of their plantation converted from natural forest
- Conversion from natural forest causing 'carbon debt'

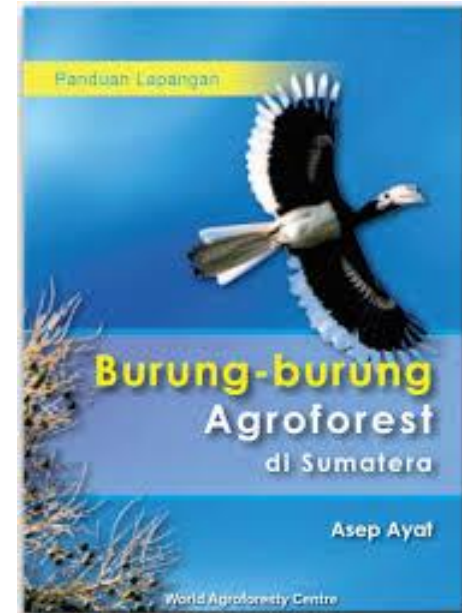


# 2 Habitat Conversion and Biodiversity Loss

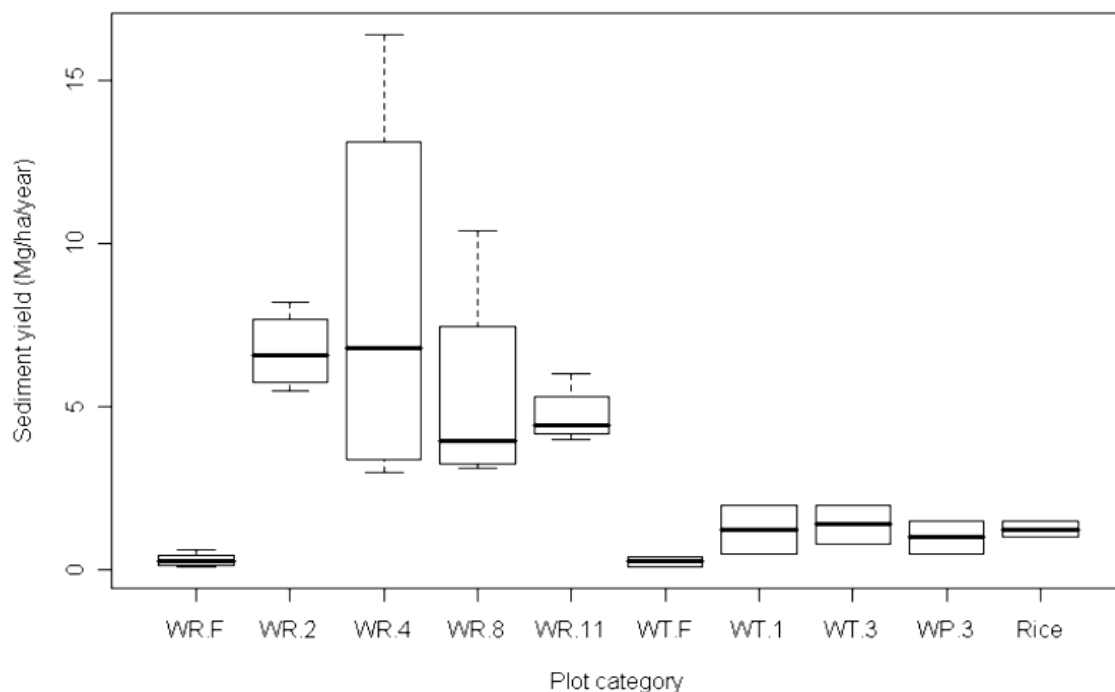
- Analysis of species richness and diversity along landscape gradient
  - Species diversity of amphibian decreased along with lesser tree coverage
  - Species diversity and richness of reptile increased when cacao plantation mixed with indigenous tree species.
- Overlapping resource uses of forest and cultivated resources by villagers and tonkean macaques (*Macacatonkeana*) in Lore Lindu National Park, Sulawesi
- Supporting forest biodiversity, providing refuge for the Red list and threatened species, and serving as biodiversity corridors that crucially connect remnant rubber agroforests for mammals living in the surrounding forest



Silhouette of a "Kongkang Kolam"  
Photographer: Asep Ayat  
Location: Curug Nangka, Bogor (West Java) - 2011



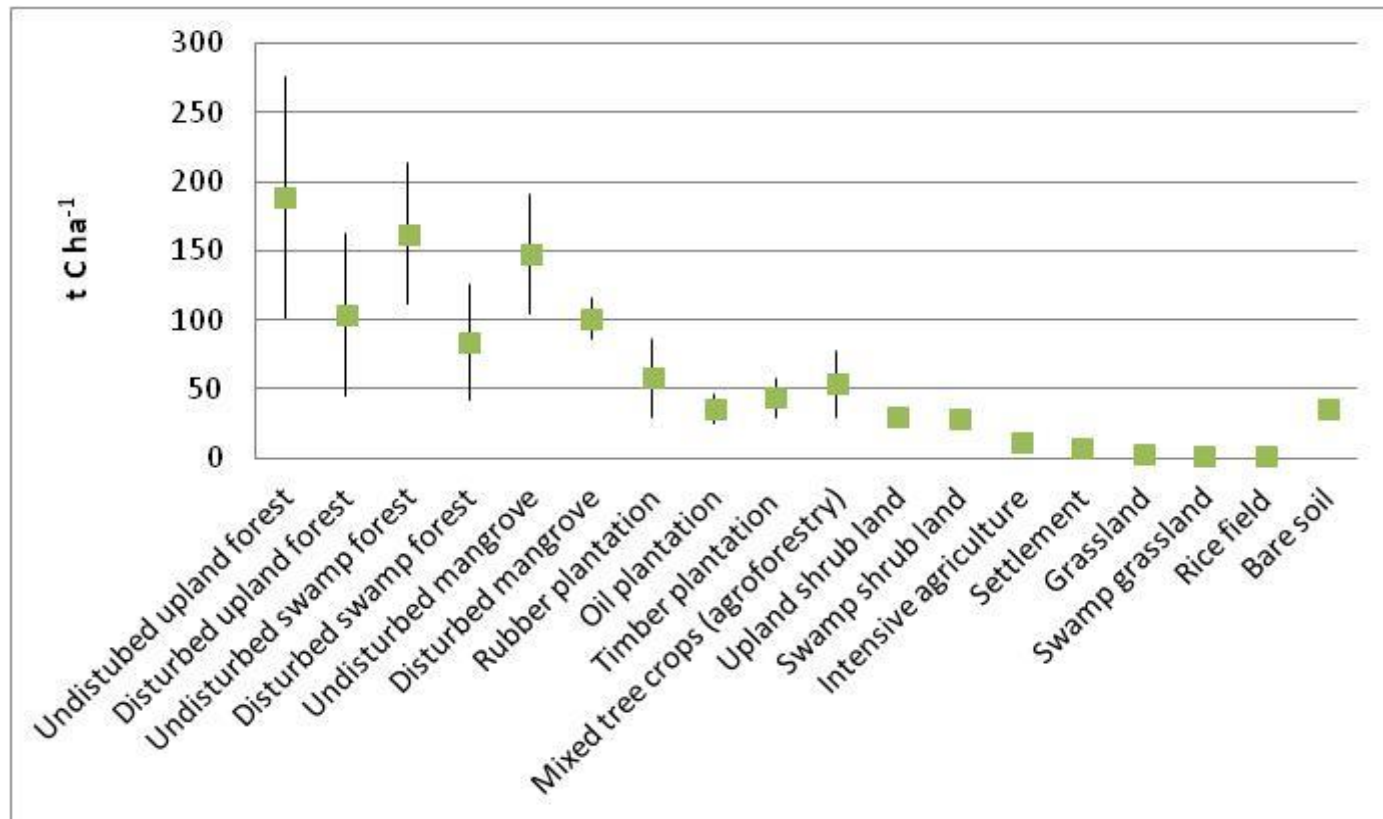
# 3 Land Degradation



- The highest erosion rate occurred in a 3-year-old coffee garden, gradually decreasing as litter layers established soil cover (Verbist et al 2005)

- Under the coffee multi-strata system, high earthworm biomass, resulting from increased organic matter, material maintains soil macro-porosity leading to better soil fertility (Hairiah et al 2006)

# 4 Aboveground carbon stock



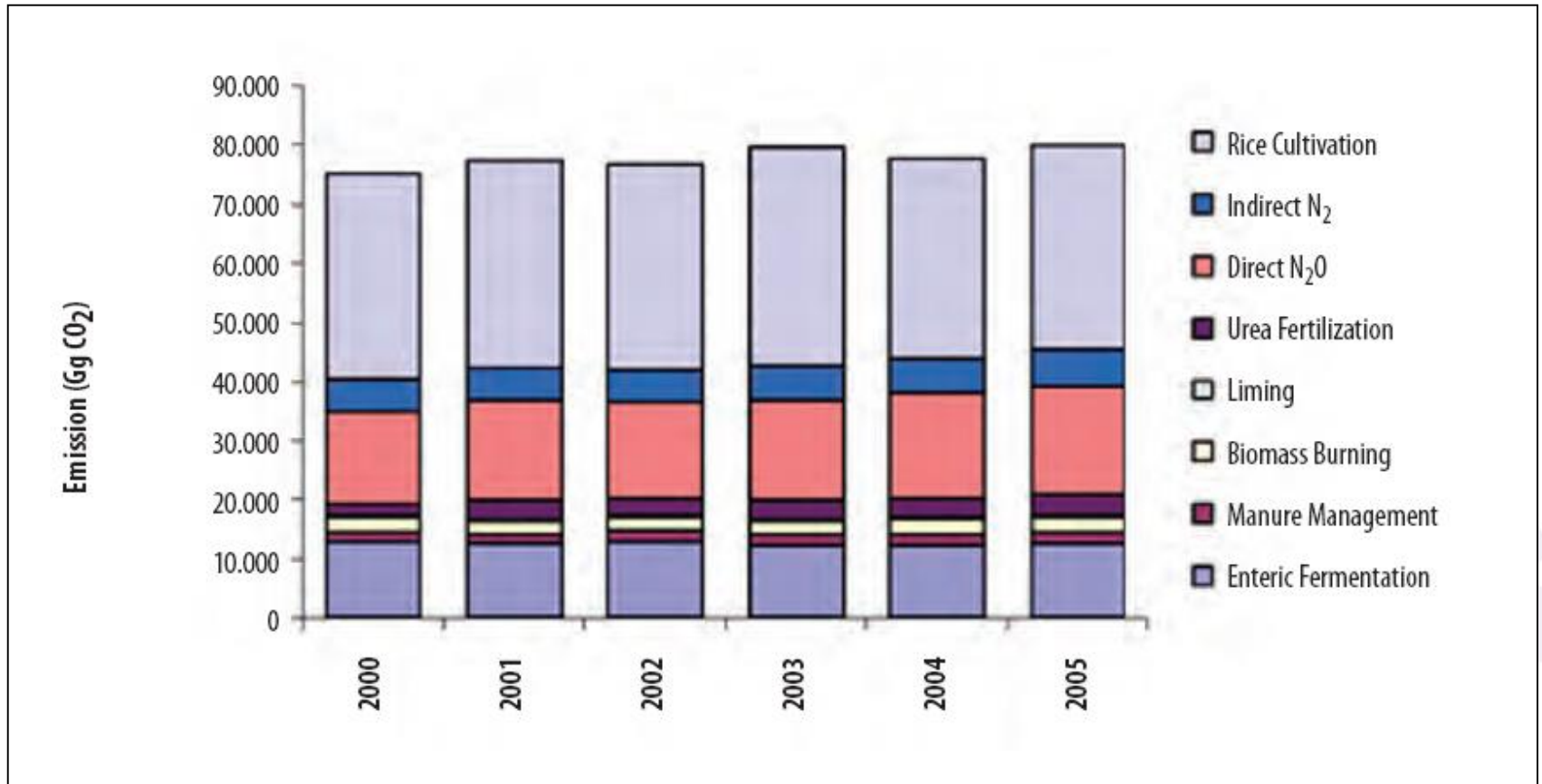
Aboveground carbon stock for various land cover (Agus et al 2013)

# 4a Aboveground carbon stock

- Time averaged aboveground carbon stock (Khasanah et al 2010)
  - Oil palm (25 th):  $40 \pm 5$  t C/ha
  - Forest : 150-250 t C/ha
  - Tree-based farming system:  
50-150 t C/ha
- ‘Carbon debt’: conversion from high-stock land cover to the lower one



# 4b GHG emissions



Types of GHG emissions from various sectors in 2000 (KLH 2010)

# 5

## Water footprint (Bulsink et al 2010)

Commodity	Water footprint (m <sup>3</sup> /ton)			
	Green	Blue	Grey	Total
Coffee	21,904 (96%)	-	1,003 (4%)	22,907
Cacao	8,895 (94%)	-	519 (6%)	9,414
Rice	2,527 (73%)	735 (21%)	212 (6%)	3,473
Oil palm	802 (94%)	-	51 (6%)	853



# B. Aspirations

New Order (prior to 1998)	Reformation (1998 – 2005)	Post-reformation (2006-now)
<ul style="list-style-type: none"><li>• Agenda 21</li></ul>	<ul style="list-style-type: none"><li>• PROPENAS</li><li>• RPJM 2004-2009</li></ul>	<ul style="list-style-type: none"><li>• RPJP 2005-2025</li><li>• RP3K 2005-2025</li><li>• SIPP 2013--2045</li><li>• NAMA-GHG reduction</li></ul>

- Environmental aspect in the aspirations of agriculture sector is still less prioritized
- Structural difference between environment and agriculture sectors slowing the greening of agricultural sector

# C. Applications

## Direct Regulations

- Land Use Planning
- Fines and re-licensing
- Prohibition of New Investment
- Environmental Impact Assessments
- Unpermitted substance

## Market Creations

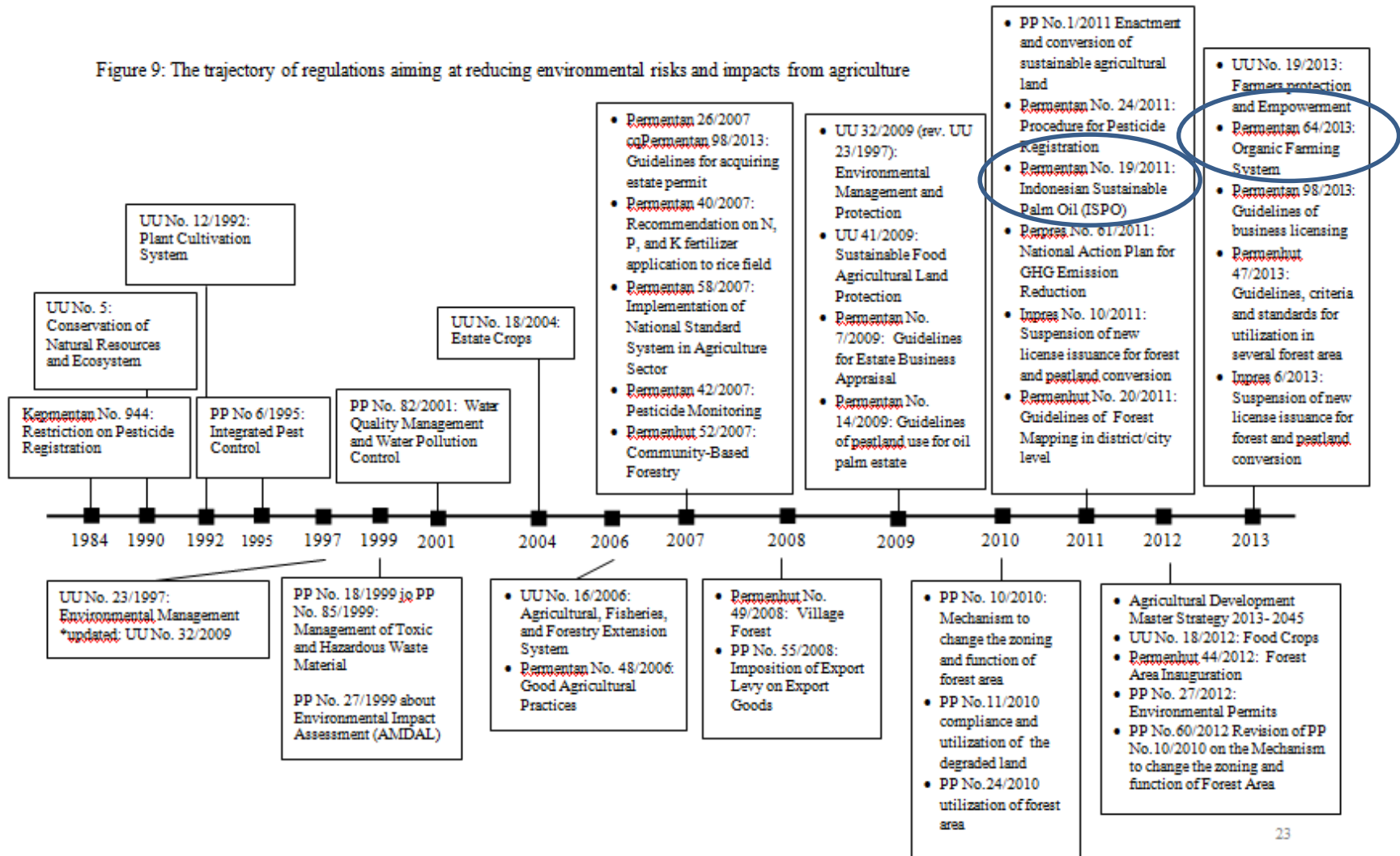
- Subsidies for Green Technology
- PES
- Green Tax
- Deposit refund
- Charges for resources use

## Education, Advocacy and Voluntary Approaches

- Education campaign
- Collaborative Management
- Certification
- Organic farming

# Applications: Trajectory of Direct Regulations

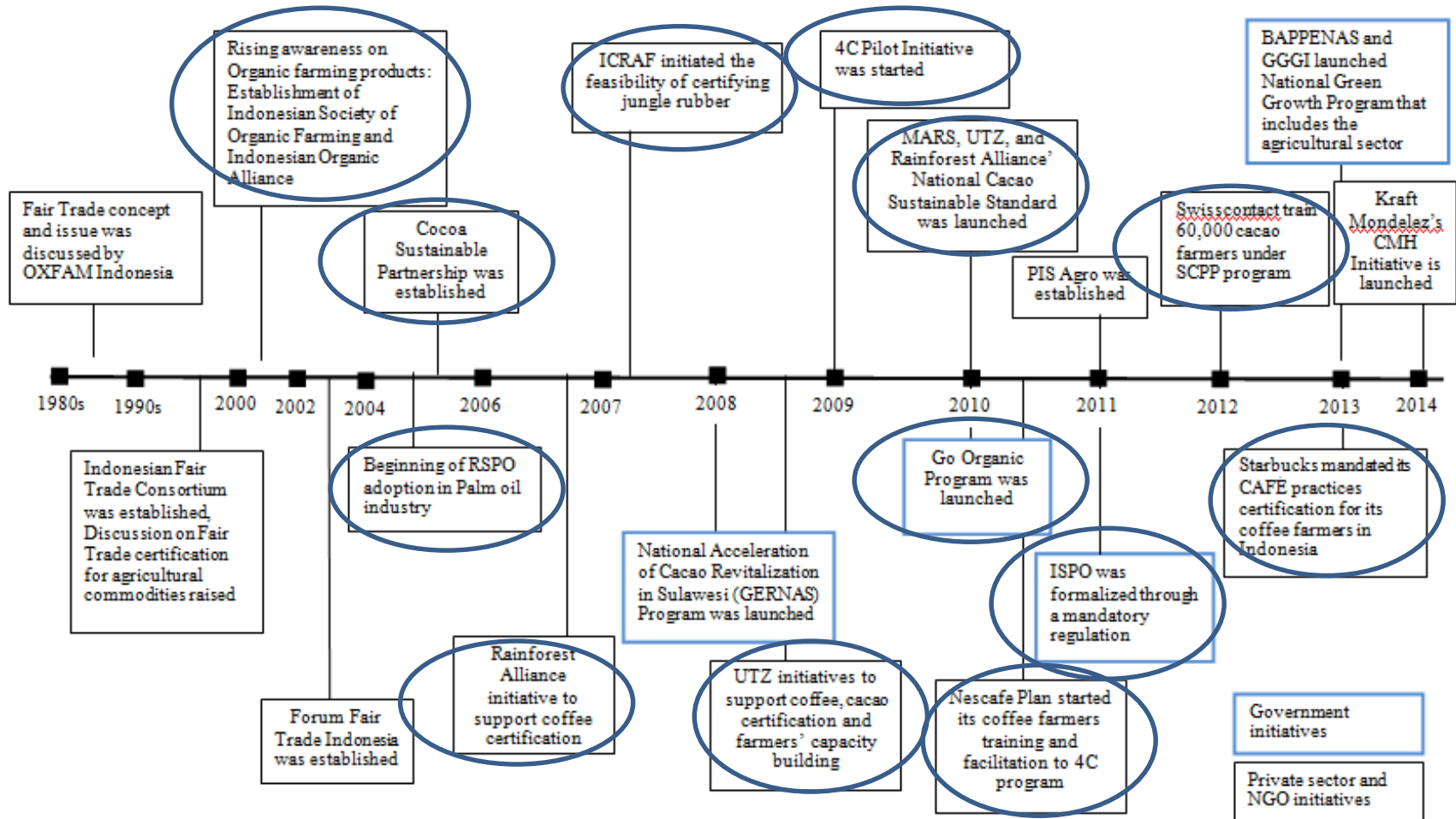
Figure 9: The trajectory of regulations aiming at reducing environmental risks and impacts from agriculture



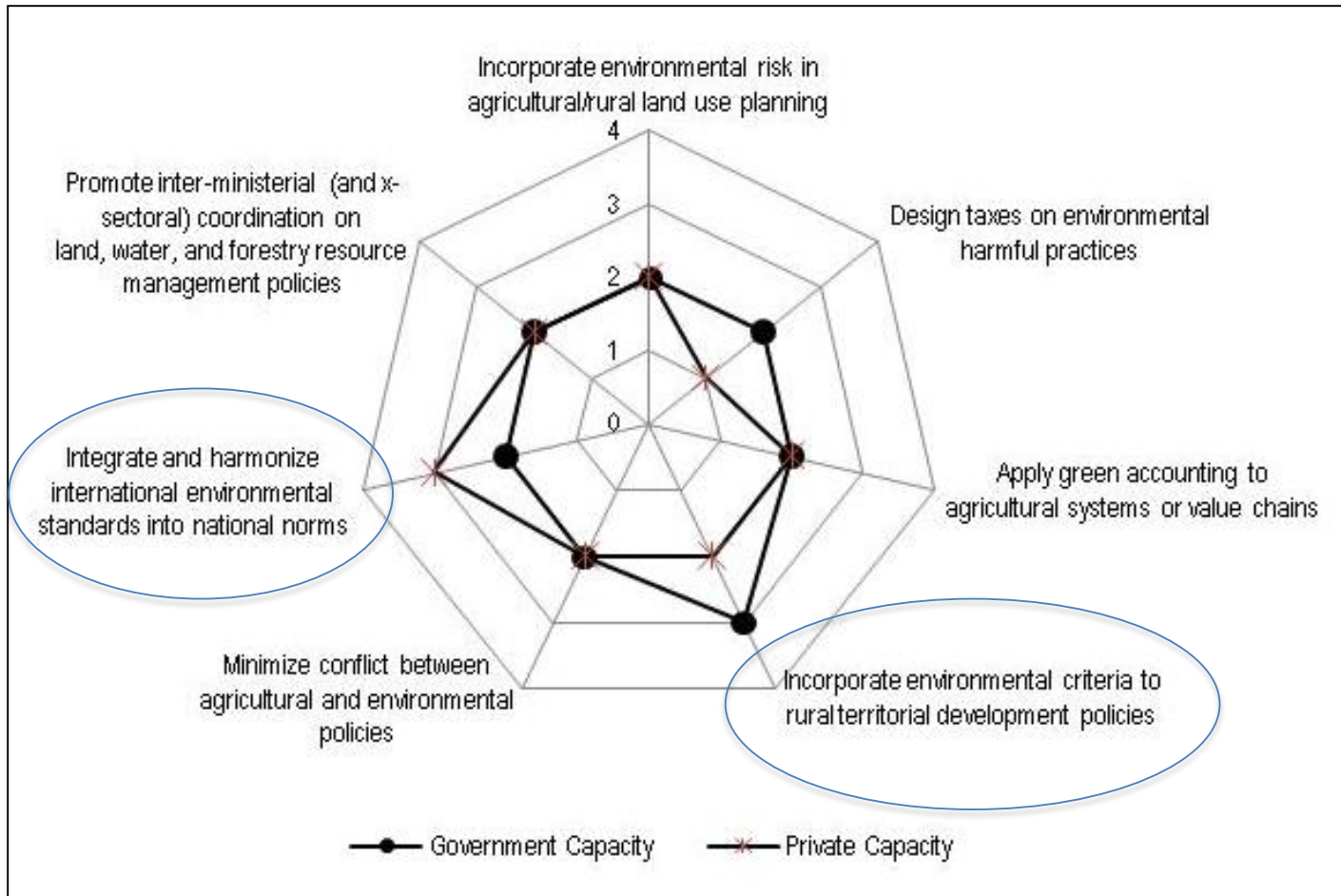
# Applications:

## Trajectory of Government and Private Initiatives

Figure 10: The Trajectory of Government and Private Sector Initiatives on Green Agriculture

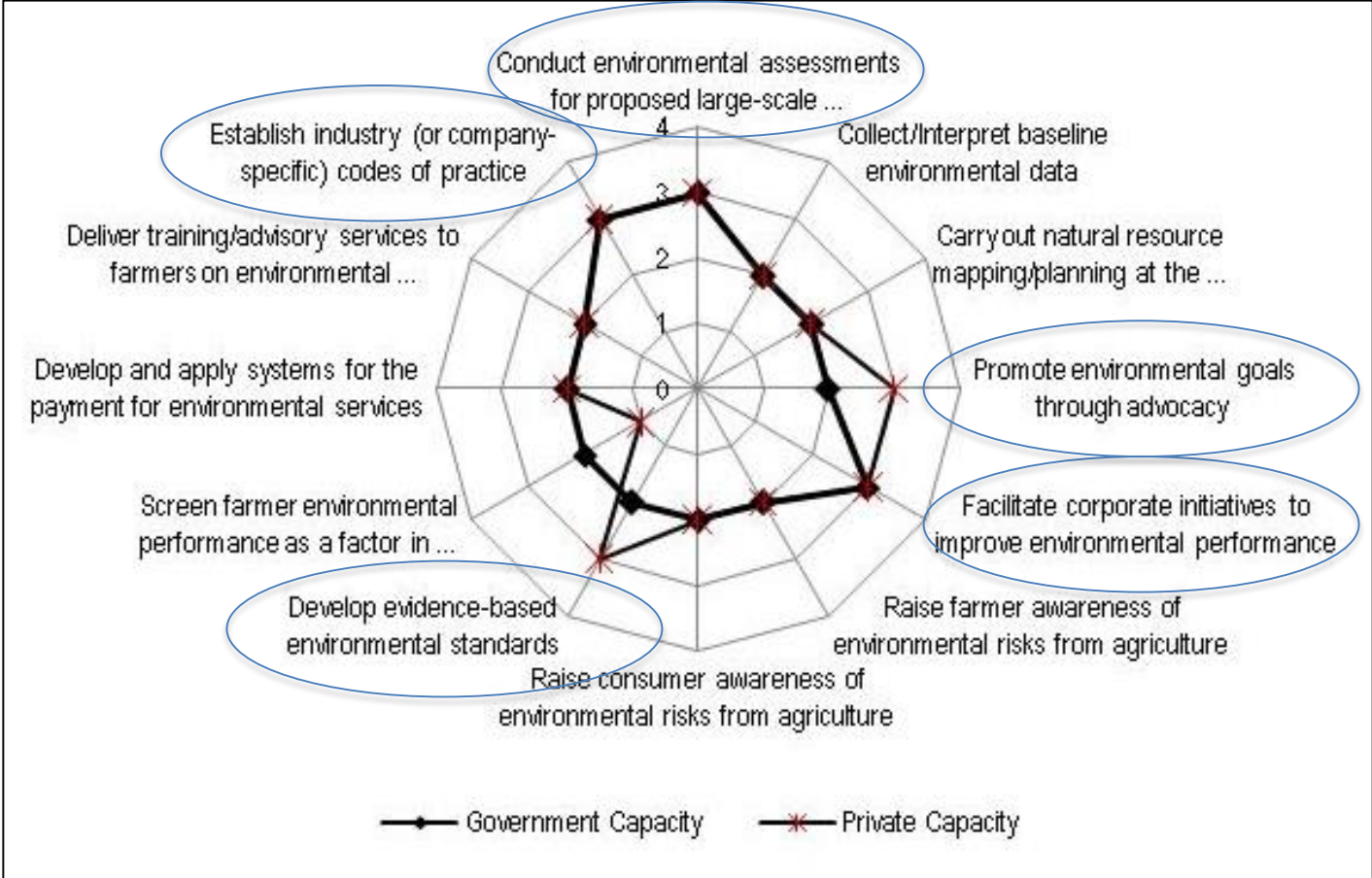


# D. Capacity: Policy Formulation



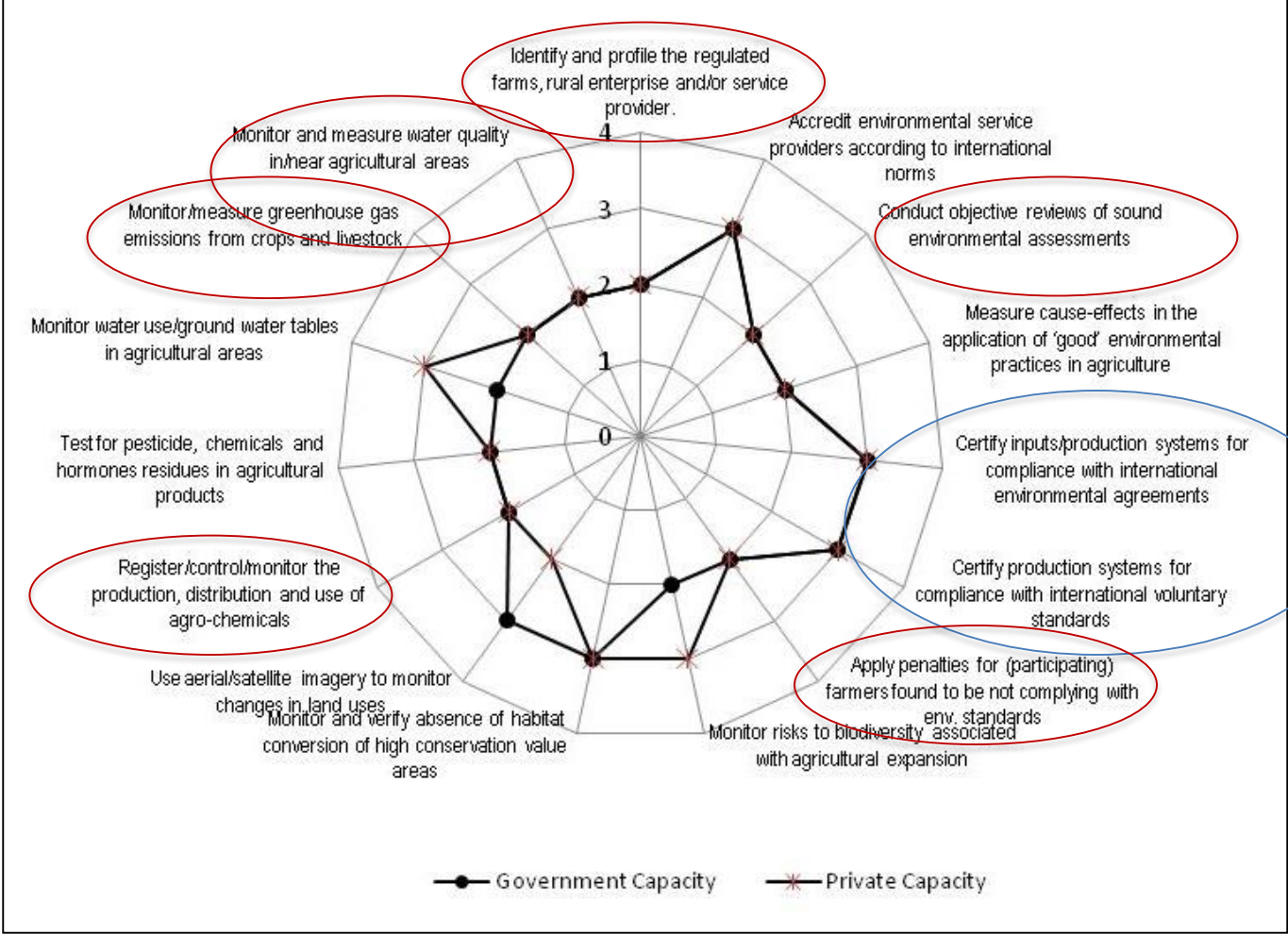
Capacity Rate: 0 = N/A; 1 = Non-Existent; 2 = Low; 3 = High; 4 = World Class

# Policy Implementation



Capacity Rate: 0 = N/A; 1 = Non-Existent; 2 = Low; 3 = High; 4 = World Class

# Compliance Assurance



Capacity Rate: 0 = N/A; 1 = Non-Existent; 2 = Low; 3 = High; 4 = World Class

# Conclusion

- Conceptually, Indonesia has embraced the green and sustainable agriculture
- The Green Agriculture aspiration in Indonesia is evolving
- The Indonesian government still focus on applying direct regulation as most significant instruments and many of these regulations stay at high and broad regulatory structure (i.e. Law) and lack of operational guidelines for its implementation.





# C onclusion

- ‘Land use and zoning’ and ‘fines or re-licensing to enforce technical regulations’ were perceived as direct regulations that are still lack of application in Indonesia.
- Economic incentive and market instruments are mostly at an early stage of their application expectedly triggered by the law promoted by the Ministry of Environment.
- ‘Information, advocacy and voluntary’ instruments are relatively well-known but not widely applied yet.
- The commodity certifications were initially endorsed by private sectors through a multi-stakeholder forum and the government responded the initiative afterwards.



# Priority Actions and Recommendations

- Land-use planning at sub-national level
- Environmental standards for agricultural commodities
  - Improving scope and context of environmental standards for agriculture domains
  - Adapting international sustainability standards to national context to allow higher adoption
- Incentive-based mechanism for better adoption of environmental friendly agricultural practices
  - Earmarking funds generated from environmental-related levies



# Priority Actions and Recommendations

- Green technology
  - Improving access of information and financial support to green agriculture technology and information for smallholders
- Advocacy
  - Improve extension systems to strengthen farmers' knowledge to carry out Good Agricultural Practices (GAP) and provide preconditions for collaborative conservation management
  - Raise public awareness on the Green Agriculture concept



# Thank you



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