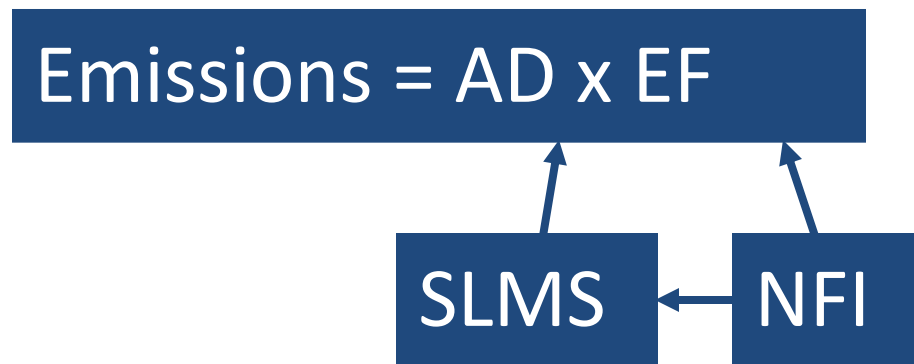


NFI Component

Nguyen Dinh Hung

Required functions

- To calculate emission/removal factors for each forest type in each ecological region
- To provide training data set for Satellite Land Monitoring System (SLMS)



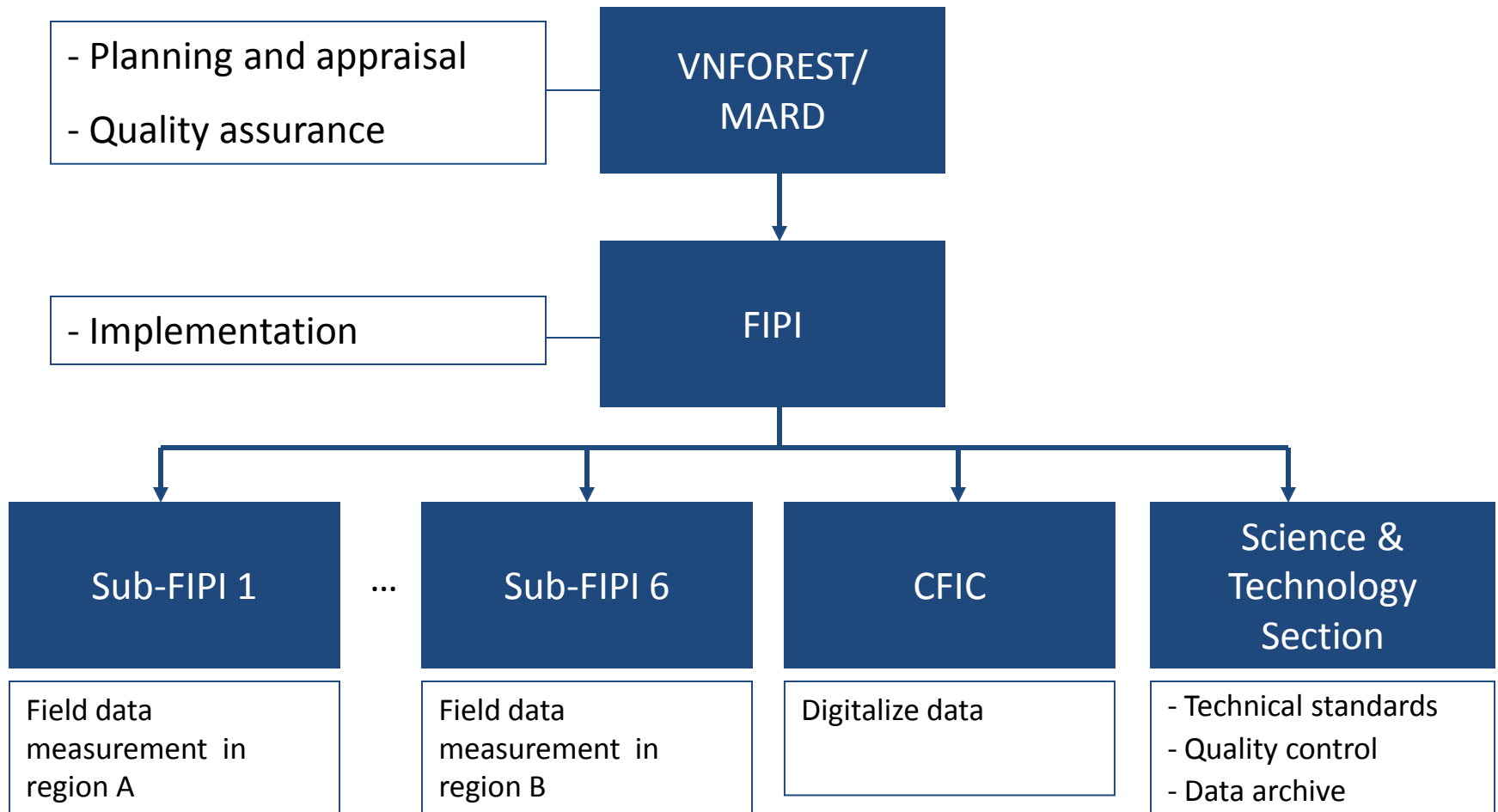
Carbon Pools To Be Monitored

- **Above-ground:** trees, shrubs
- **Below-ground:** roots
- **Dead-wood:** logs, fallen branches
- **Litter:** fine woody debris, dead leaves
- **Soil organic matter:** carbon that has been incorporated into the mineral soil

Previous NFIMAPs

- Implemented since 1991 by FIPI, 5-year cycle, 4 cycles completed.
- Based on systematic permanent sample plots (but number varies through cycles)
- Parameters include:
 - Tree: Species, DBH, height, quality
 - Soil: mechanical composition, moisture, humus depth
 - Socio-economical cond.: labour, income etc.

Institution Arrangement



Other Relevant Stakeholders

- Local forest inventory and planning agencies (belonging to DARD)
- FPD (central, province, district and commune levels)

Technical Gaps for Carbon Stock Estimation

- **Above-ground biomass:** only stem biomass, no data for others (branches, foliage, seeds)
- **Below-ground biomass:** no data
- **Dead-wood:** no data
- **Litter:** no data
- **Soil:** not enough data
- **Accuracy level:** unclear

Solutions to Technology Gaps

- Evaluate accuracy level of existing data
- Re-design sample plot system (method, location, size, shape) if necessary
- Apply new measurement techniques
- Develop country-specific allometric equations for other parts of trees
- Identify new parameters to be measured
- Develop field measurement manuals

Capacity Gaps

- More frequently (two-year cycle)
- More parameters to be measured: tree age, heights of more trees, crown diameter, deadwood, soil, etc.
- Larger area: non-forested land, trees outside forest



- Need more staff for FIPI and/or involvement of other relevant stakeholders (FPD etc.)?
- Need more equipment/instruments
- Train staff of new measurement protocols

GHG-Inventory for REDD+ Component

Phung Van Khoa
Nguyen Dinh Hung

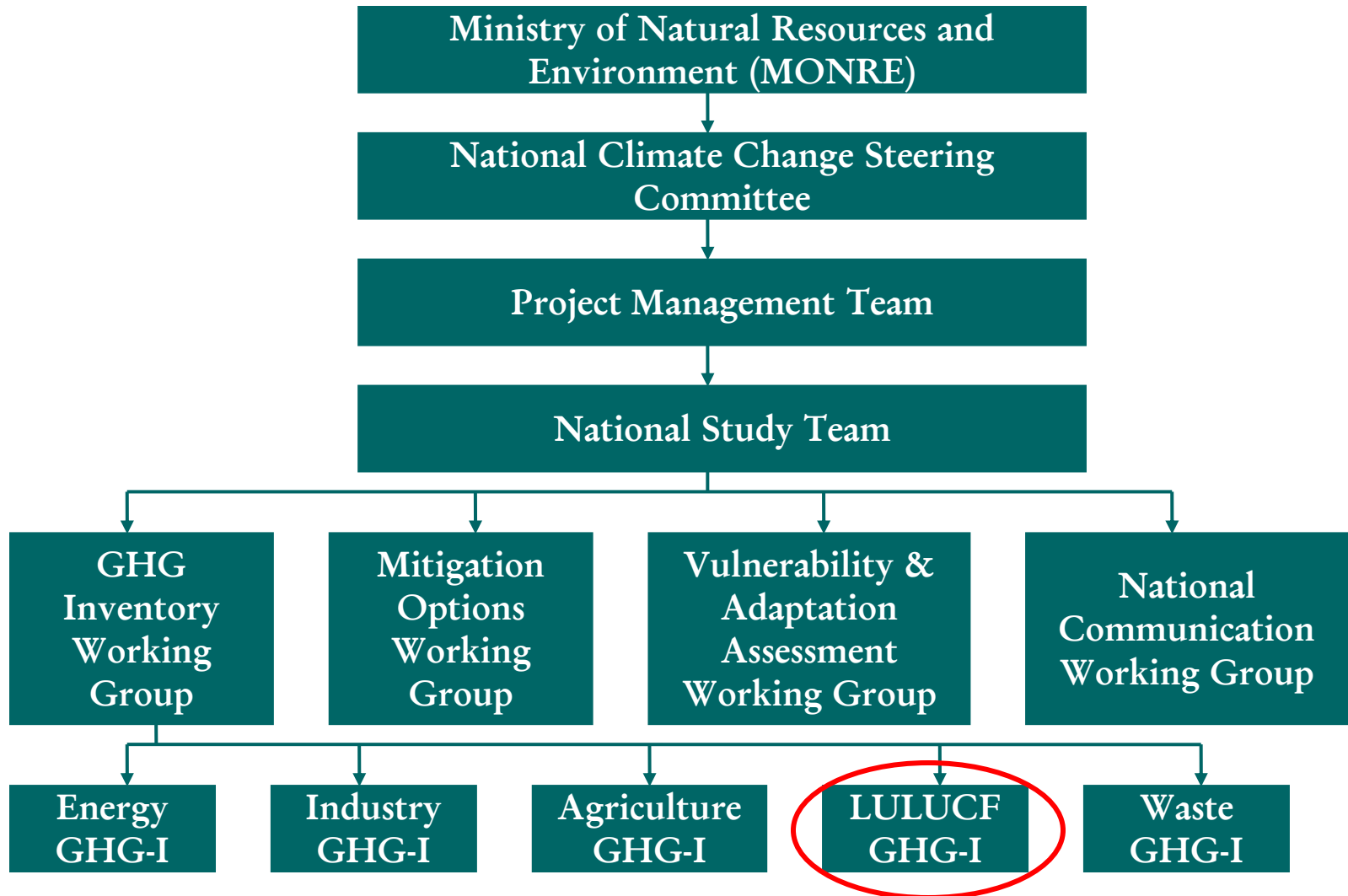
Required functions

- To estimate CO₂ emissions/removals for REDD+ activities
- To assess uncertainty

Previous GHG-Inventories

- Initial National Communication (reported for the year 1994)
- Second National Communication (reported for the year 2000)

Institutional Arrangement



Methodology for LULUCF GHG-I

- Followed Revised 1996 IPCC Guidelines using default conversion/expansion factors
- Used the gain-loss (as vs. stock-different) method
- Monitored processes:
 - Changes in forest & other woody biomass stocks
 - Forest and grassland conversion
 - Abandonment of managed land
 - CO₂ emissions/removals from soil

Data and Sources

Category	Data	Data source
General	Land area and forest area	GSO (Statistical Year-book) FIPI FSIV Agricultural Economic Institute Forestry Science & Technology Association of Viet Nam Union of Science and Technology Associations
Changes in forest & other woody biomass stocks	Area of forests, forestland	
	Annual growth rate	
	Annual rate of AGB growth	
	Wood and Timber Volume	
	Harvested amount	
	Other Parameters	
Forest and grassland conversion	Wood and Timber Volume	
	Area of conversion	
	Status of biomass burning	
Abandonment of managed land	Area of land abandonment	
	Annual re-growth rate	
CO2 emissions/ removals from soil	Area of organic soil cultivation	
	Amount of agricultural lime applied	
Other	Uncertainty Assessment	RCFEE (FSIV)

GHG emissions/removals from LULUCF in 2000 (SNC)

Unit: thousand tonnes

Source/sink	CO ₂ emis.	CO ₂ rem.	CH ₄	N ₂ O	CO ₂ e
Forest & other woody biomass stocks		-49,830			-49,830
Forest and grassland conversion	40,665		140	1	43,910
Abandonment of managed land		-7,330			-7,330
CO ₂ emissions/removals from soil	46,944	-18,588			28,356
Total	87,609	-75,748	140	1	15,105

Cross-check with other results

Year	1990	1995	2000	2005	2010
Forest Area (1000 ha)					
FRA 2010	9,363	na	11,725	13,077	13,797
NORDECO Report	9,711	8,538	11,406	11,917	na
Volume (million m³)					
FRA 2010	658	na	794	855	870
NORDECO Report	1,042	821	1,017	1,185	na
Aboveground carbon stock (million tonnes)					
FRA 2010	610	na	727	753	778
NORDECO Report	848	702	902	1,008	na
Aboveground CO₂ sequestration (million tonnes)					
FRA 2010	2,237	na	2,666	2,761	2,853
NORDECO Report	3,109	2,575	3,309	3,696	na

Forestry-related CO₂ emissions/ removals in 2000

Unit: thousand tonnes

Source/sink	Emissions	Removals	Changes
Forest & other woody biomass stock		-49,830	-49,830
Forest and grassland conversion	40,665		40,665
Abandonment of managed land		-7,330	-7,330
Total	40,665	-57,160	-16,495

- ▣ Average rates of CO₂ emissions/removals during the period 2000-2005 computed from FRA2010 and NORDECO reports are **-19** and **-77** million tonnes per year, respectively
- ▣ Three reports agree that CO₂ removals by forests are larger than CO₂ emissions from forests in Vietnam

Gaps in GHG-I for LULUCF

- Technical gaps
 - Lack of country-specific conversion/expansion factors (will be addressed by new researches from FSIV, VFU, FIPI?)
 - Lack of data or poor data quality in some categories (will be addressed by the new MRV for REDD+?)
- Capacity gaps
 - No permanent human resources designated/responsible for GHG-I (will be addressed by the JICA-funded project?)

Thank you for your attention!