

# The 9<sup>th</sup> Workshop on GHG Inventory in Asia (WGIA 9)

July 13-15, 2011

Phnom Penh, Cambodia

## GHG Inventory in Myanmar: INC Report

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# Country Profile:

- **Export:** US\$ 6.8 billion\*
- **Import:** US\$ 4.5 billion\*
- **Main Exports:** Agriculture, livestock and forestry products, natural gas
- **Main Imports:** Machinery, transportation and construction materials, industrial raw materials, consumer goods

## Role of Agriculture sector

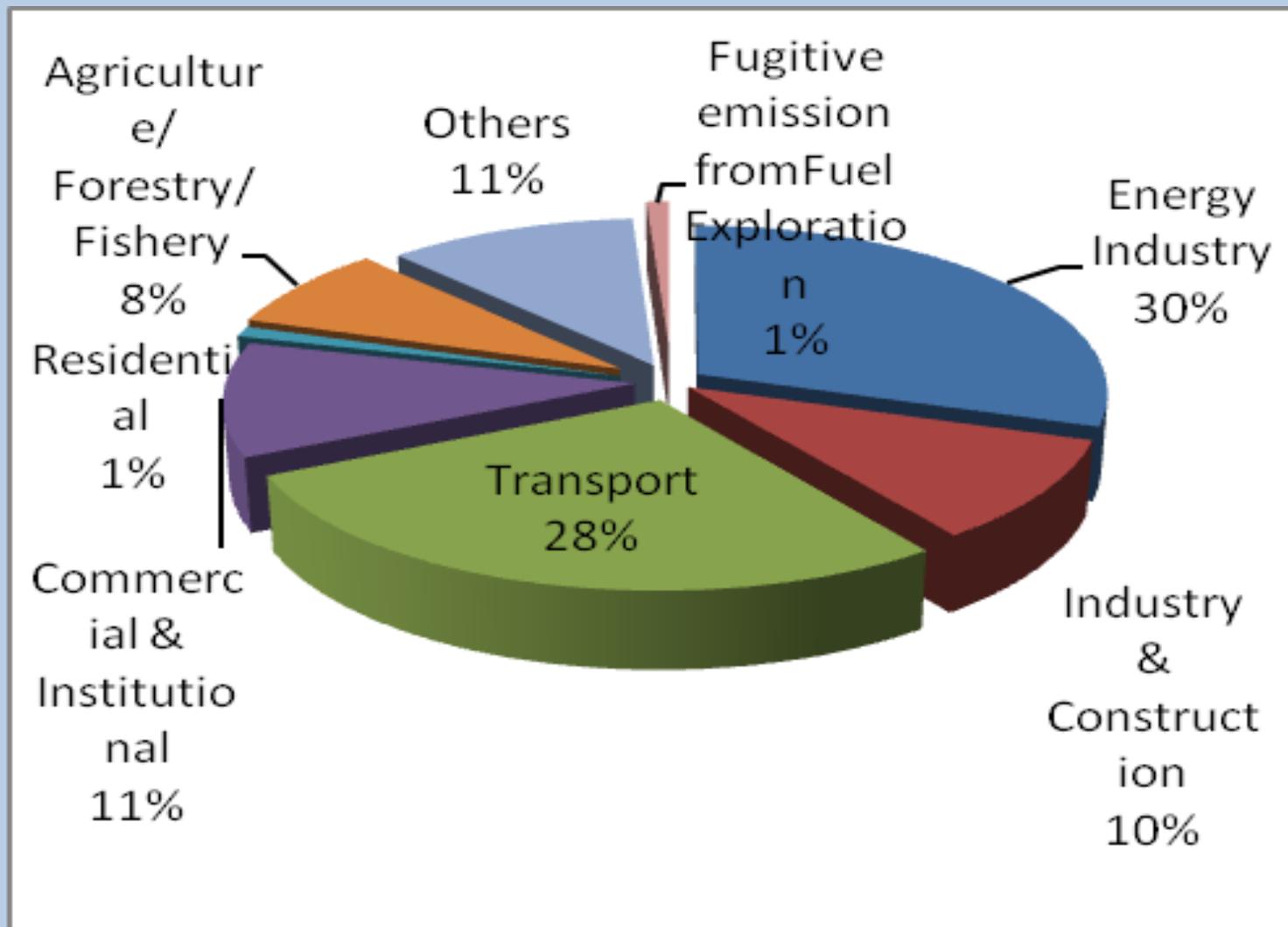
- 43% of GDP (including **crops (35%)**, **livestock & fisheries (7%)** and **forestry (1%)**)
- 61% of Labor Force
- 44% of Export Earnings (**crops (17%)**, **livestock & fisheries (20%)** and **forestry (7%)**)

# Total Greenhouse Gas Emissions from Energy Sector 2000 (Gg)

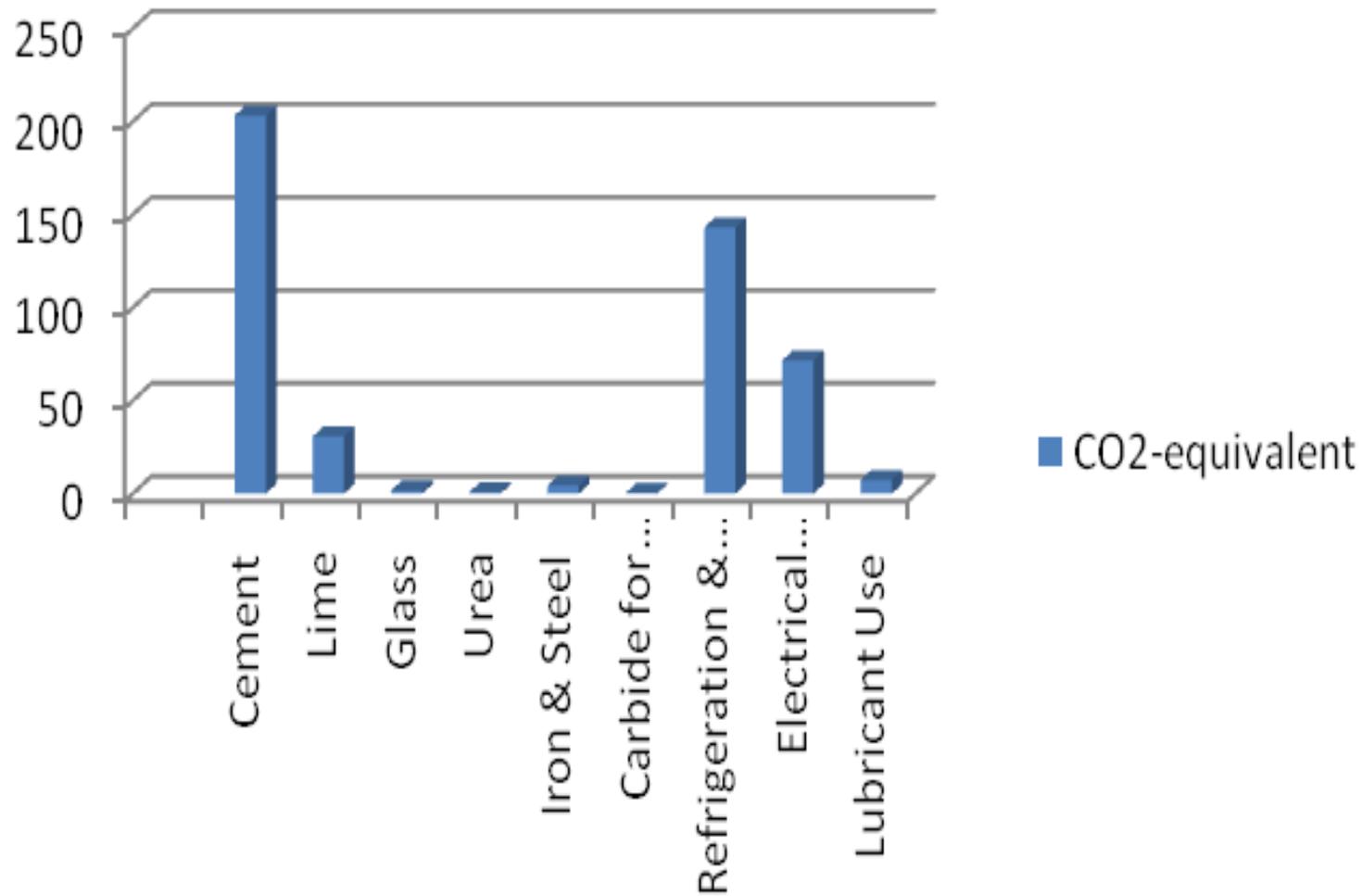
<b>Emission sources</b>	<b>CO<sub>2</sub></b>	<b>CH<sub>4</sub></b>	<b>N<sub>2</sub>O</b>	<b>Total CO<sub>2</sub> e</b>
<b>Fuel Combustion</b>				
<b>- Fossil fuel combustion</b>	7,658.65	0.46	0.28	<b>7755.11</b>
<b>-Traditional biomass fuel combustion*</b>	(27,475.3)	(7.36)	(0.98)	<b>(28297.82)</b>
<b>Fugitive emissions from coal mining</b>	-	0.53	-	<b>11.13</b>
<b>Fugitive emissions from oil and gas systems</b>	-	4.63	-	<b>97.23</b>
<b>Total</b>	<b>7,658.65</b>	<b>5.62</b>	<b>0.28</b>	<b>7,863.47</b>

\*Not included in national GHG inventory calculations.

# Proportions of CO<sub>2</sub>-equivalent Emissions from Energy Sector



# GHG Emissions from Industrial Processes and Product Use, 2000 (Gg)



## Sown Area of Major Crops (,000 ha)

Sr. No.	Crop Name	2009-2010	Percentage
1.	Paddy	8067	47.5
2.	Sesamum	1634	9.6
3.	Green gram	1077	6.3
4.	Black gram	1023	6.0
5.	Sunflower	883	5.2
6.	Groundnut	866	5.1
7.	Pigeon pea	616	
8.	Other Pulses	706	
9.	Wheat & Maize	466	
10.	Rubber	463	
11.	Cotton	359	
12.	Sorghum	224	
13.	Sugercane	160	
14.	Oil Palm	112	
15.	Coffee	24	
16.	Vegetables	270	
17.	Others	19	
	<b>Total Crop Area</b>	<b>16969</b>	

## Country Profile:

- Area **676,557** Km<sup>2</sup>, between 9° 32' N to 28° 32'N; 92° 10' E to 101° 11'E
- Population: **57.5 m**
- **135** nationalities

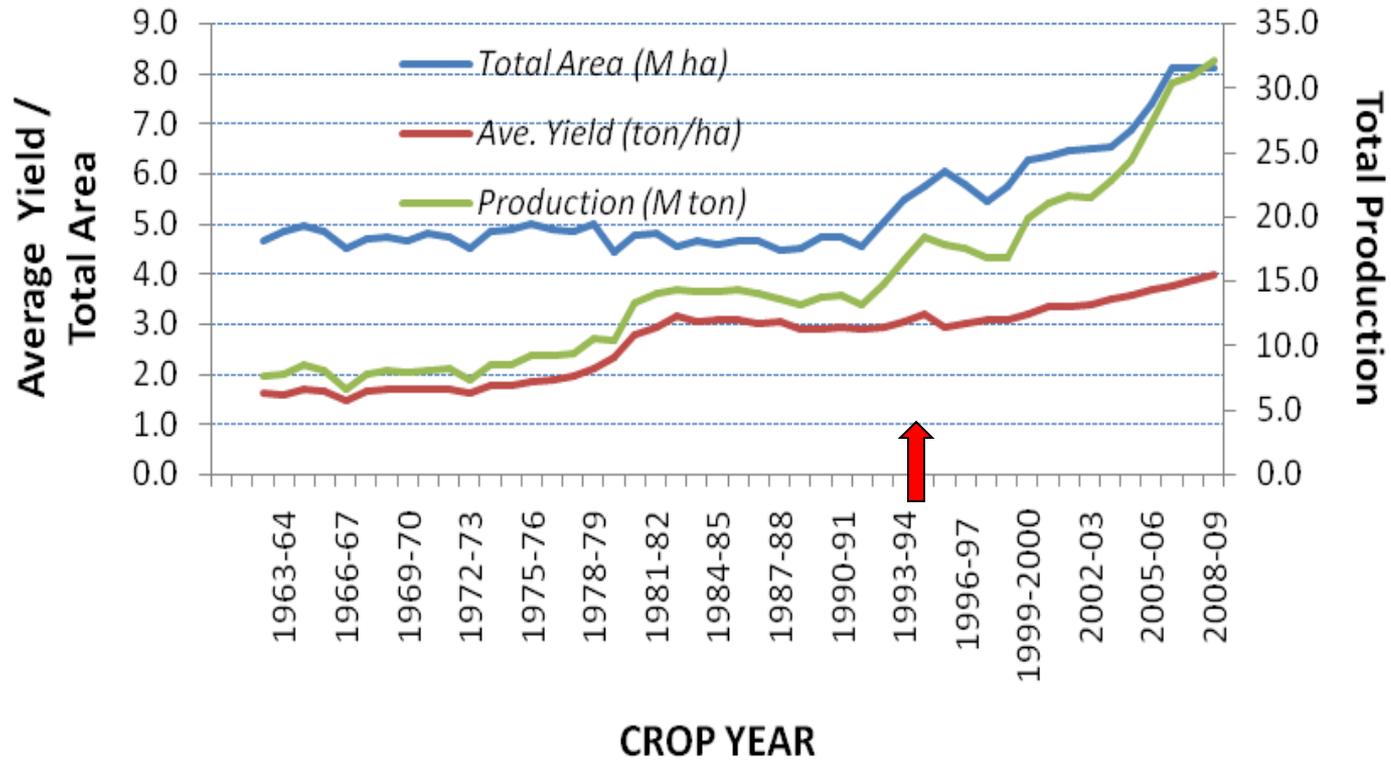
**Ayeyarwady Region is the rice bowl of Myanmar**



## Major Rice Producing Areas

Divisions	Share in rice area (%)	Share in population (%)
Ayeyarwady	29	14
Bago	16	10
Sagaing	12	11
Yangon	9	12
Others	34	53

**Fig 28. Total area, average yield and total production of rice (1963-2009)**



- The sharp increase in rice area after 1993 attributed to the additional rice area for summer rice.
- The increase summer rice area, coupled with the yield increase, resulted in a significant increase in rice production after 1993

“Lowland Rice-based Ecosystems in Nyaungdon Township of Ayeyarwaddy” Garcia, et.al. 2010, ASEAN Round Table Meeting, Myanmar

# Rice Ecosystems in Myanmar

Sr.	Type	%
1	Irrigated	30
2	Favorable Rain-fed Area	38
3	Drought Prone Area	12
4	Deepwater, submerged and salt affected Rice	17
5	Upland rice	3



Irrigated rice fields in Northern Shan State



Terrace upland rice fields in Northern Shan State



## Transplanting in Flooded Areas



## Lowland Areas



# Construction of New Reservoirs and Dams



Irrigation Facilities installed in the last 2 decades: 228 Large and Small Rural Dams



Lifting water from rivers:  
322 river-pump stations established  
to area of 0.47 m ac

# Promoting Ecosystem Based-Adaptation

## Supplementary Water for Rice Production, Central Myanmar

A Total of 7974 tube wells:  
Shallow / Deep tube wells - for  
> 100,000 acres, after 2007-08



## Treadle-pump/ Tripod pump



# Paddy Harvest Time in Central Myanmar



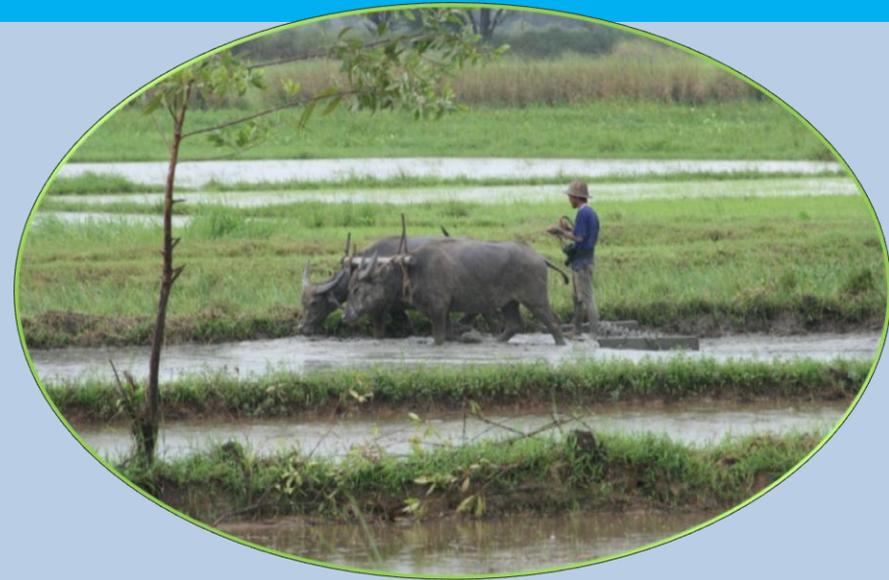
Paddy harvest time – short stubble left



Paddy straw for animal feed

# Livestock Population Census (in millions)

Kind of Animal	2000-01
Cattle	10.98
Buffalo	2.44
Sheep & Goat	1.80
Pigs	3.97
Chickens	47.75



## GHG Emissions / Removals from LULUCF Sector in 2000

Activity	CO <sub>2</sub> emissions (Gg)	CO <sub>2</sub> removals (Gg)	Net CO <sub>2</sub> emissions/ removals (Gg)
<b>Natural forests</b>	-	<b>129 838.59</b>	<b>(-) 129 838.59</b>
<b>Forest plantations</b>	1 863.21	11 750.04	(-) 9 886.833
<b>Home garden trees</b>	-	470.07	(-) 470.07
<b>Roadside trees</b>	-	162.49	(-) 162.49
<b>Shifting cultivation</b>	<b>1 200.67</b>	-	<b>(+) 1 200.674</b>
<b>Deforestation</b>	<b>37 340.97</b>	-	<b>(+) 37 340.974</b>
<b>TOTAL</b>	<b>40 404.73</b>	<b>142 221.2</b>	<b>(-) 101 816.5</b>

# GHG Emissions and Removals in Myanmar for the Year 2000

Source / Sink	CO2 Removal	CO2 Emission	CO	CH4	N2O	Nox	CO2 Equ. Total	CO2 Equ.Net Emission
Energy Sector		7658.65		5.62	0.28		7863.47	7863.47
Industry Sector		248.59					463.29	463.29
Agriculture Sector			0.81	963.76	8.4	0.022	22844.57	22844.57
Forestry Sector	142221.2	33656.51	2215.37	144.85	4.26	34.08	40404.73	-101816.5
Waste Sector				134.57			2825.97	2825.97
<b>TOTAL</b>	<b>142221.2</b>	<b>41563.75</b>	<b>2216.18</b>	<b>1248.77</b>	<b>12.94</b>	<b>34.10</b>	<b>74402.03</b>	<b>-67819.2</b>

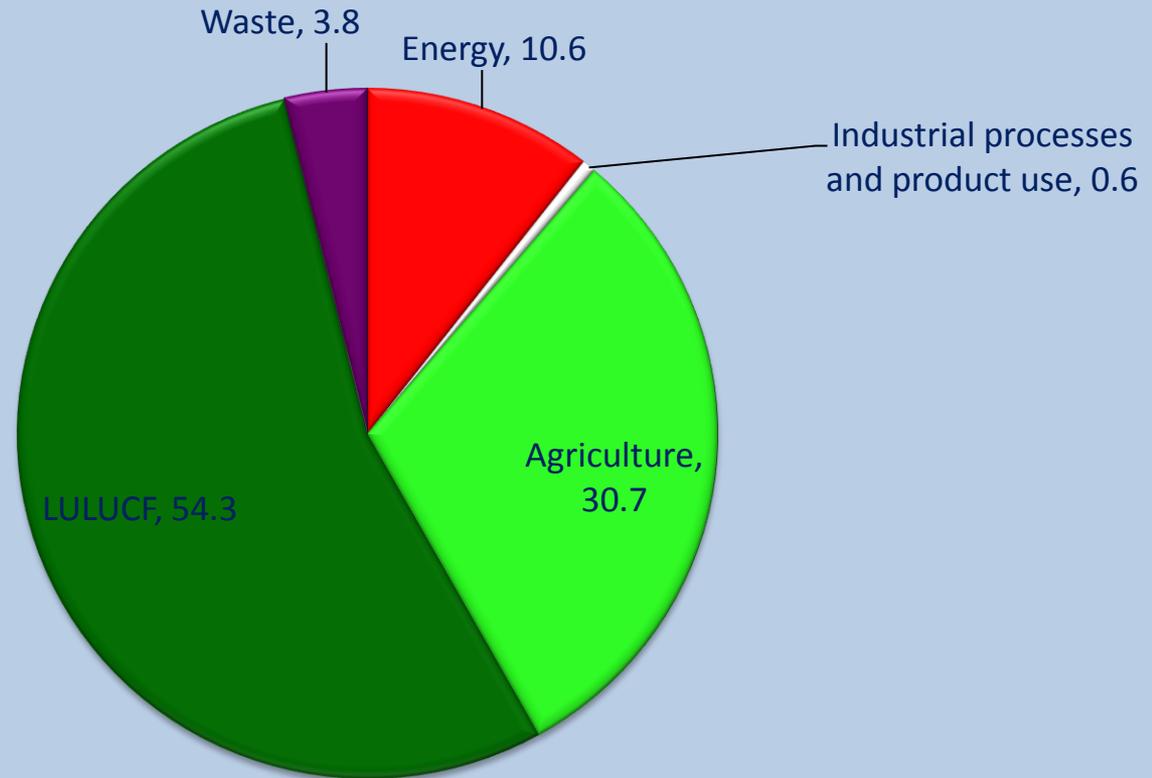
Source: INC Report, 2010

# Myanmar National GHG Inventory of Agriculture Sector in 2000

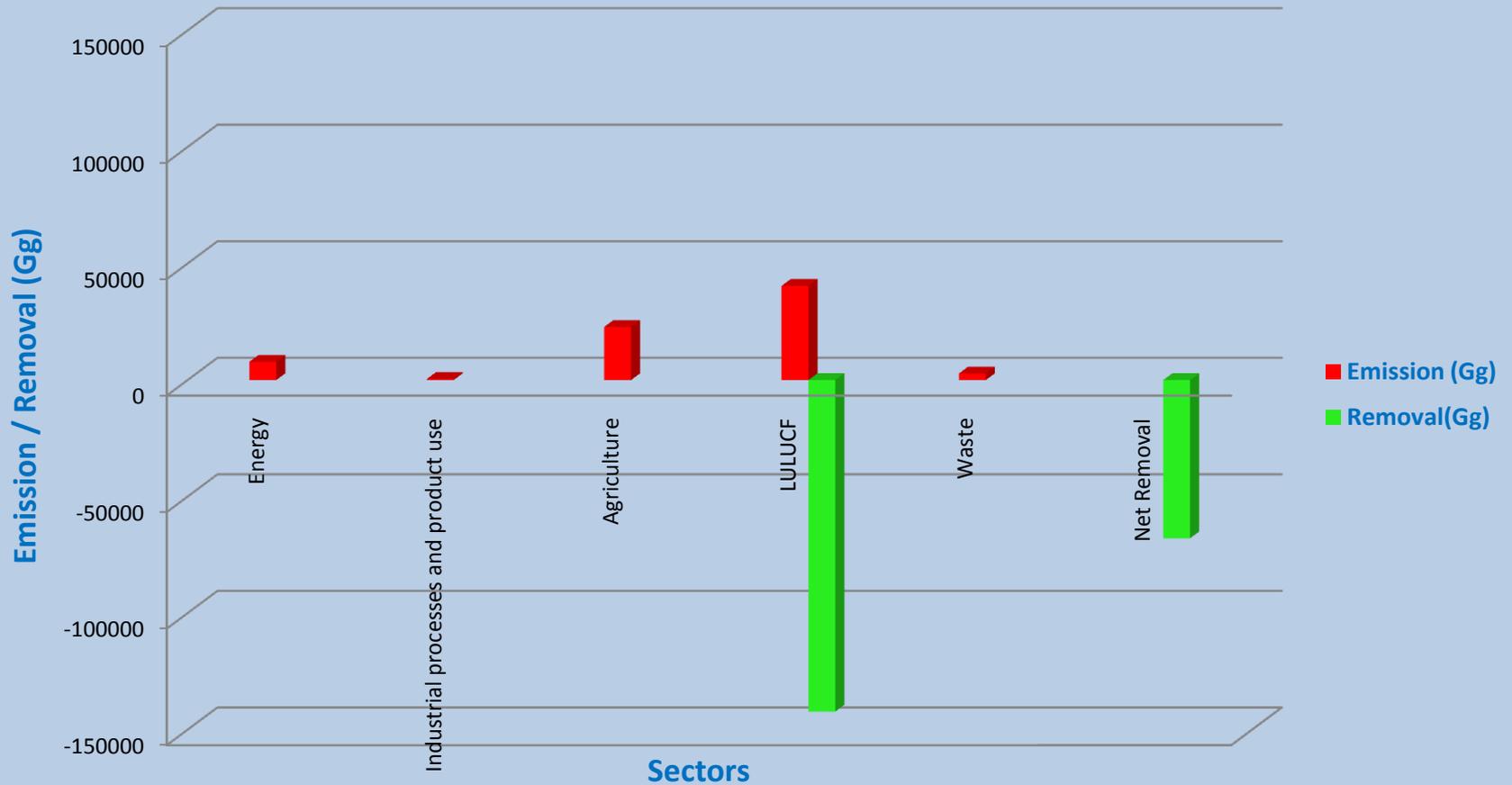
Sources	CH4 (Gg)	N2O (Gg)	Nox (Gg)	CO (Gg)	CO2 (Gg) Equavalen t
<b>Rice Cultivation</b>	<b>507.26</b>				<b>10652.46</b>
<b>Agricultural soils</b>		<b>8.2</b>			<b>2542.0</b>
<b>Agricultural residue burning</b>	<b>0.0238</b>	<b>0.0006</b>	<b>0.81</b>	<b>0.022</b>	<b>1.6058</b>
<b>Livestock sector</b>	<b>456.50</b>				<b>9648.5</b>
(a) Enteric fermentation	404.43				8493.03
(b) Manure management	52.07	0.2			1155.47
<b>TOTAL</b>					<b>22844.57</b>

# GHG Emissions and Removals in Myanmar for the Year 2000

## Share of emission by sector (%)



# GHG Emissions and Removals in Myanmar for the Year 2000



“Myanmar do not have the **carbon debt** to the world, and we are still one of the **lowest emitters** in capita terms. But we do have a **shared responsibility** for the world.”

## Limitations and Constraints

- **Lack of Institutional arrangements for data collection, analyzing, verifying and updating data**
- **Research, assessment and verification for certain activity data , and country-specific emission factors remains incomplete**
- **Lack of financial and technical support for developing CS Efs**
- **There is an inadequate GHGI technical experts in the ministries and agencies**
- **Difficult to engage full time committed and dedicated team members**

## **Future Inventory**

- **For preparing SNC: The activities or plans for the next GHG inventory has not setting up**
- **Setting up an institutional framework, an organization system, and capable technical expertise**
- **To develop a permanent system for National GHGI preparation; A National GHG Inventory Office needs to be established to coordinate the GHG inventory**
- **In the system, various Government agencies, policy makers and scientists, researchers should be involved**
- **It needs a project: “Capacity Building for National GHGI” to strengthen the capacity and help to improve the GHGI**

## Proposed Action Plans for SNC

- Formulate and support to establish a strong GHG Inventory institutional mechanism
- Formulate effective, efficient and proactive overall development **policy** and **institutional mechanism** of mitigation and adaptation to the impacts of CC on agriculture and food security
- Strengthen **national research and extension programs** in the context of CC
- Improve the regional **information sharing networks**, dissemination and analysis on CC
- **Technical and financial assistances** on above action plans



**THANK YOU**