Challenges and Strengths

in developing GHG inventory

CHINA

Xiaohua Zhang, Yue Qi

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National Center for Climate Change Strategy and International Cooperation

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- ☐ Development of China's GHG inventory

- ☐ Challenges in developing GHG inventory

- ☐ Efforts to strengthen domestic MRV system

☐ Development of China's GHG inventory

- 1994 National GHG Inventory: 2001~2004

  China: Initial National Communication on Climate Change

- 2005 National GHG Inventory: 2008~2012,

  2nd National communication

- 2008 National GHG Inventory: published in Jan. 2014

❑ Development of China's GHG inventory

Guidelines:

- ***Revised 1996 IPCC Guidelines for National GHG inventory***

- ***Good Practice Guidance and Uncertainty Management in National GHG inventories***

- ***......***

1994 National GHG inventory

GHGs	Emission % (excl. LULUCF)
CO_2	73.5%
CH_4	19.7%
N_2O	7.2%
Total	3650 $MtCO_2e$

Energy	89.9%	2795 Mt	3073 Mt
Industrial process	10.1%	278 Mt	
Carbon sequestration (land use change and forestry)		- 407 Mt	2666 Mt

Agriculture	50.3%	17.20 Mt	34.29 Mt
Energy	27.3%	9.37 Mt	
Waste	22.5%	7.72 Mt	

Agriculture	92.5%	786 kt	850 kt
Energy	5.9%	50 kt	
Industrial process	1.8%	15 kt	

☐ 2005 National GHG inventory

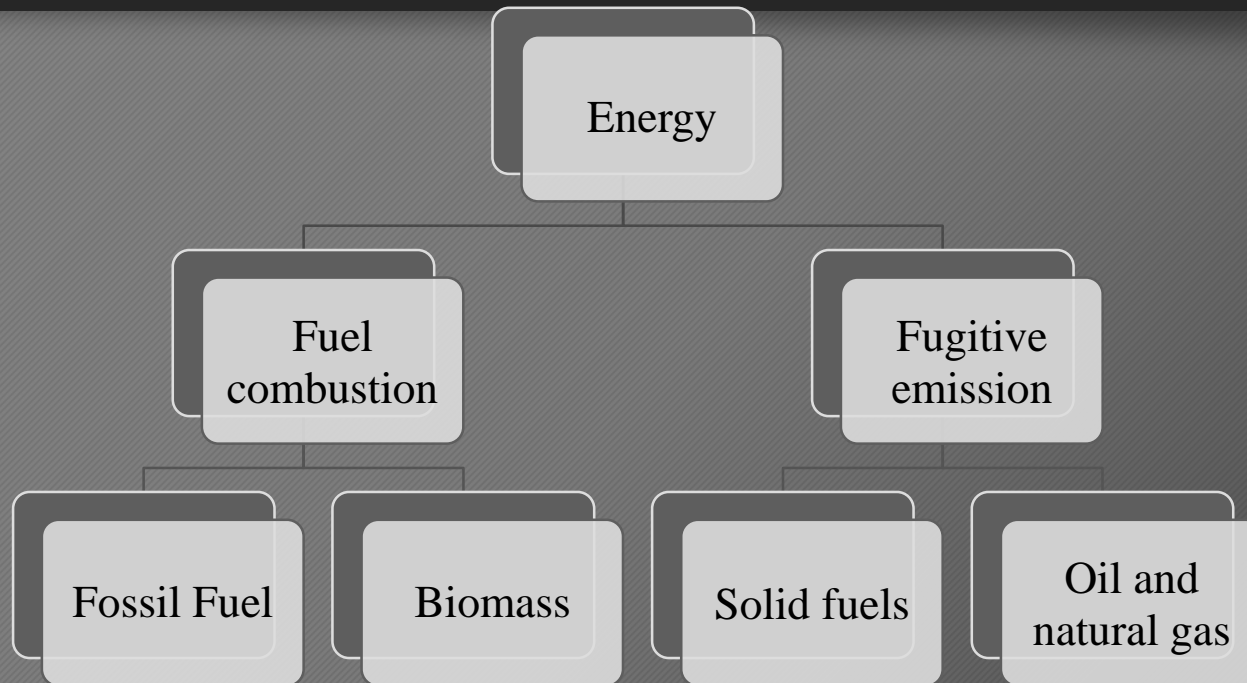| GHGs	Emission % (excl. LULUCF)
CO_2	80.0%
CH_4	12.5%
N_2O	5.3%
HFCs	
PFCs	2.2%
SF_6	
Total	7467 MtCO$_2$e

Energy	90.4%	5404 Mt	5976 Mt
Industrial process	9.5%	569 Mt	
Carbon sequestration (land use change and forestry)		- 421 Mt	5554 Mt

Agriculture	56.6%	25.17 Mt	44.46Mt
Energy	34.7%	15.43 Mt	
Waste	8.6%	3.83 Mt	

Agriculture	73.8%	0.94 Mt	1.27Mt
Energy	10.3%	0.13 Mt	
Industrial process	8.7%	0.11 Mt	
Waste	7.2%	0.09 Mt	

Industrial process	1650 Mt

2008 National GHG inventory

GHGs	Emission % (excl. LULUCF)
CO_2	82.2%
CH_4	11.1%
N_2O	4.4%
HFCs	
PFCs	2.4%
SF_6	
Total	8810 MtCO$_2$e

Energy	89.9%	6510 Mt	7240 Mt
Industrial process	10.1%	730 Mt	
Carbon sequestration (land use change and forestry)		- 460 Mt	6780 Mt

Agriculture	46.4%	21.57 Mt	
Energy	43.4%	20.13 Mt	46.44Mt
Waste	10.1%	4.69 Mt	

Agriculture	73.4%	0.91 Mt	
Energy	12.1%	0.15 Mt	
Industrial process	6.5%	0.08 Mt	1.24Mt
Waste	8%	0.1 Mt	

Industrial process	2100 Mt

☐ **Energy**

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                    │  Energy  │
                    └────┬─────┘
            ┌────────────┴────────────┐
      ┌─────┴──────┐           ┌──────┴──────┐
      │    Fuel    │           │  Fugitive   │
      │ combustion │           │  emission   │
      └─────┬──────┘           └──────┬──────┘
      ┌─────┴─────┐           ┌────────┴────────┐
┌──────────┐ ┌─────────┐ ┌────────────┐ ┌──────────────┐
│Fossil Fuel│ │ Biomass │ │ Solid fuels│ │   Oil and    │
└──────────┘ └─────────┘ └────────────┘ │ natural gas  │
                                        └──────────────┘
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1. Coal Consumption:
   Categories and terminal-use of coal
   Quality of coal (lower heat level/carbon content)
   Oxygenation efficiency

2. Fugitive emission
   Coal mining
3. Biomass energy
   Localized emission factors

☐ **Land use change and Forestry**

- **Methodology:**

  Significant differences between Tier 2 of Revised IPCC Guidelines for National GHG Inventory and Tier 3 of 2006 IPCC Guidelines for National GHG Inventory;

- **Data availability:**

  Key data for some major activities are missing, e.g. land use change, arable land management, grassland degeneration, forestry soil carbon, the inventory can not fully reflect the contribution of land use change and forestry sector to the GHG emission/sink.

- **Uncertainty:**

  Although various approaches have been applied for calculation of activity level and emission factors, due to the lack of samples, there are still large uncertainties in the assessment of some indicators, for some other cases, the results are even not available.

☐ Challenges in developing GHG inventory

Uncertainties in methodologies, activity level, emission factors:

- ✓ Differences between governmental statistical classifications and the requirement for inventory, absence of data for some activity level indicators;

- ✓ Activity level data based on typical surveys are not sufficient;

- ✓ Emission factors based on sample tests and field measurements are lack of representativeness;

- ✓ Emission factors assessed in 2005 are used for some calculations due to the lack of updated studies.

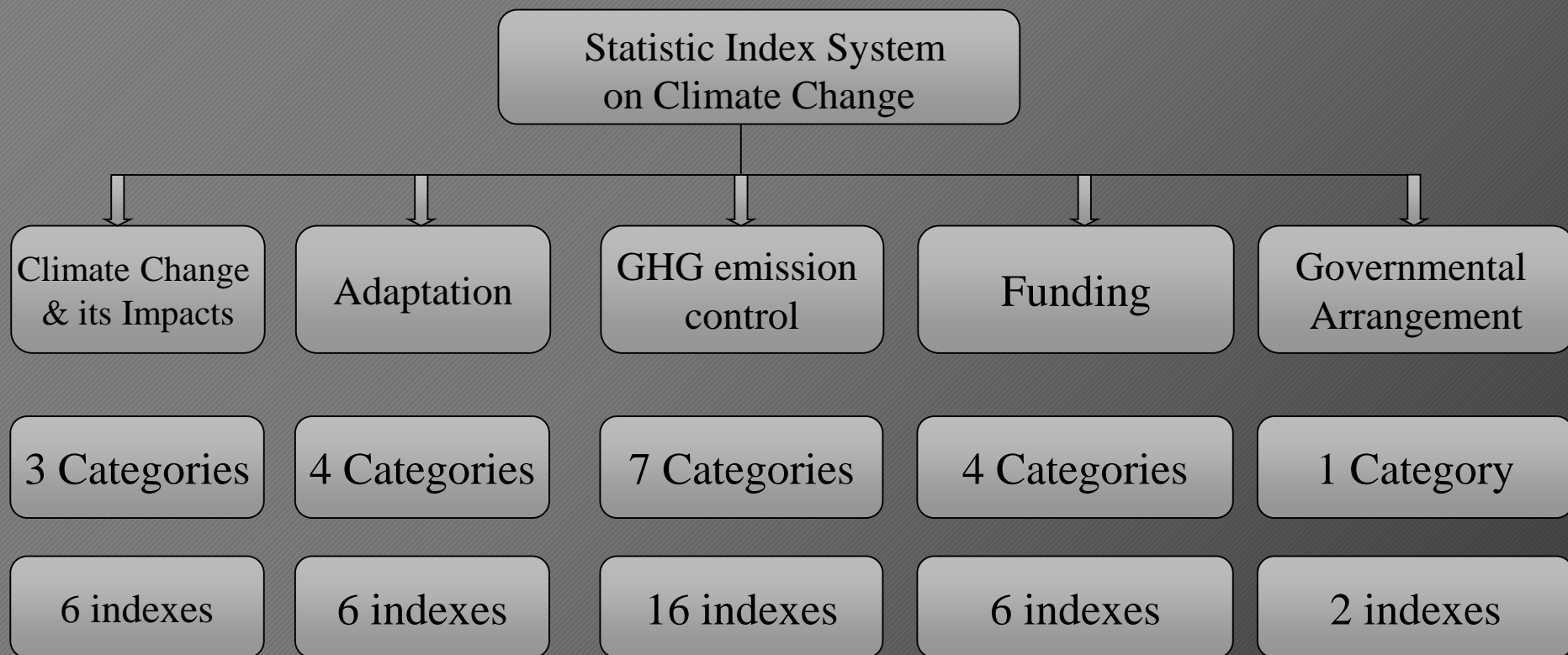# ☐ Efforts to strengthen the domestic MRV system

- Meet the report requirements of GHG inventory under the UNFCCC;

- Facilitate domestic mitigation actions.

☐ Efforts to strengthen the domestic MRV system

- Suggestions on enhancing Climate change statistics by National Development and Reform Commission and National Bureau of Statistics

- Work plan for controlling GHG emission during the 12th 5-year period by the State Council

- Assessment methods for the progress and achievement of CO_2 emission per GDP reduction targets

- Suggestions on enhancing Climate Change statistics

Establish Statistic Index System on Climate Change

- Suggestions on enhancing Climate Change statistics

1. Climate change and its impacts

GHG concentration	Climate Change	Impacts of Climate Change

CO_2 concentration

Mean temperature

Mean precipitation

Sea level changes

Areas influenced by floods and droughts

Economic losses caused by meteorological disasters
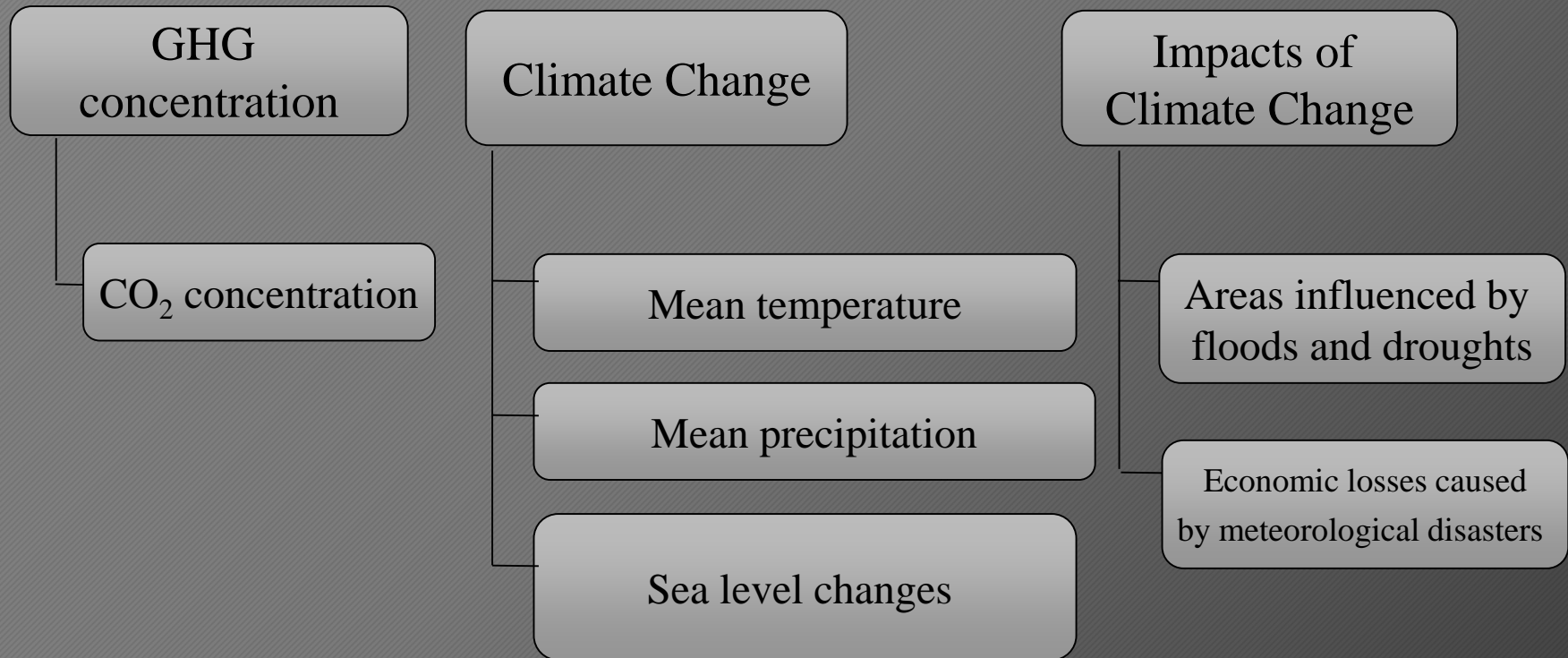
- Suggestions on enhancing Climate Change statistics

2. Adaptation

Agriculture

Forestry

Water Resources

Coastal area

Area of protected arable lands

Area of recovered desertification lands

Index of efficient irrigation

Area of off-shore and coastal wetland

Area of new grassland

Irrigated area
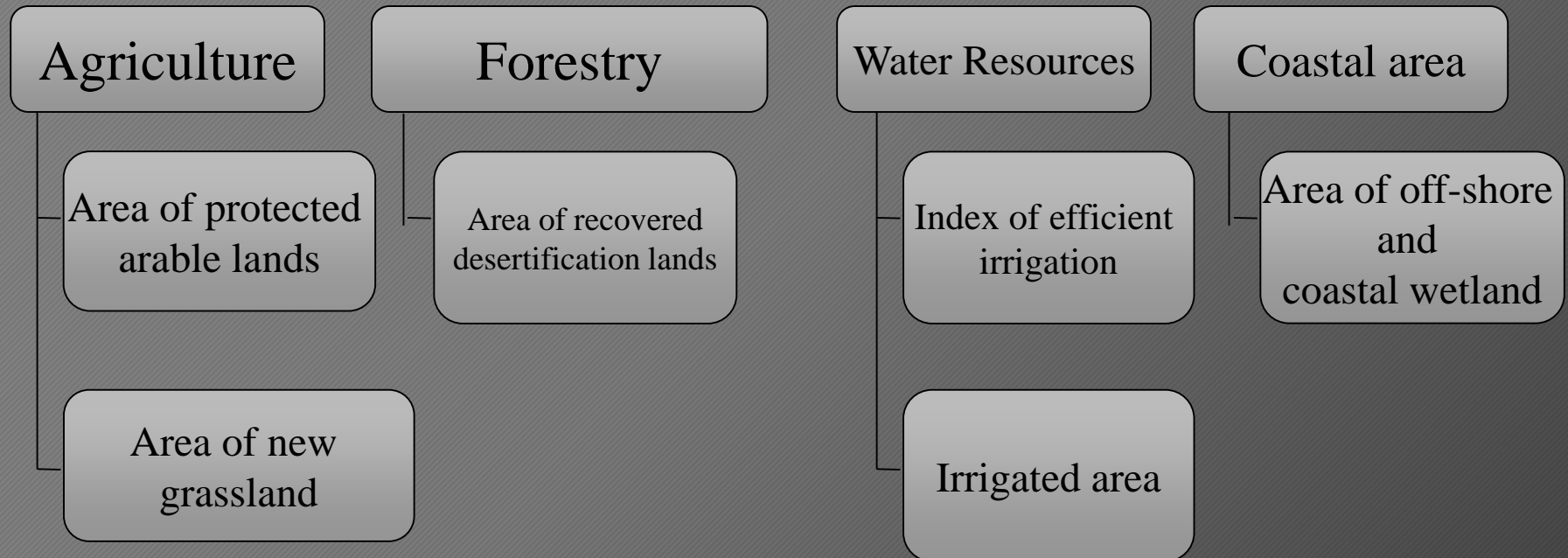
- Suggestions on enhancing Climate Change statistics

3. GHG emission control

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General
├─ Reduction of CO₂ Emission per GDP

GHG emissions
├─ Total GHG emission
└─ Sectoral GHG emission (5 sectors)

Restructuring industry
├─ Proportion of tertiary industry
└─ Proportion of strategic emerging industries

Energy conservation & enhance energy efficiency
├─ Reduction in energy consumption per GDP
├─ Reduction in energy consumption per industrial added value
└─ Reduction in energy consumption unit area

Development of non-fossil fuel energy
└─ Non-fossil fuel primary energy consumption

Enhance forestry carbon sink
├─ Forest coverage
├─ Forest volume
└─ Area of new forest

Industrial, agricultural GHG emission control
├─ Substitution rate of waste in cement production
├─ Reclamation rate of metal
├─ Fertilized area
└─ Yield of marsh gas
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- Suggestions on enhancing Climate Change statistics

4. Funding

For science & technology	For adaptation	For mitigation	Others
Research on climate change	Flood control projects	Energy conservation	Capacity building on GHG emission statistic and assessment
		Non- fossil fuel development	
		Enhance forestry carbon sink	
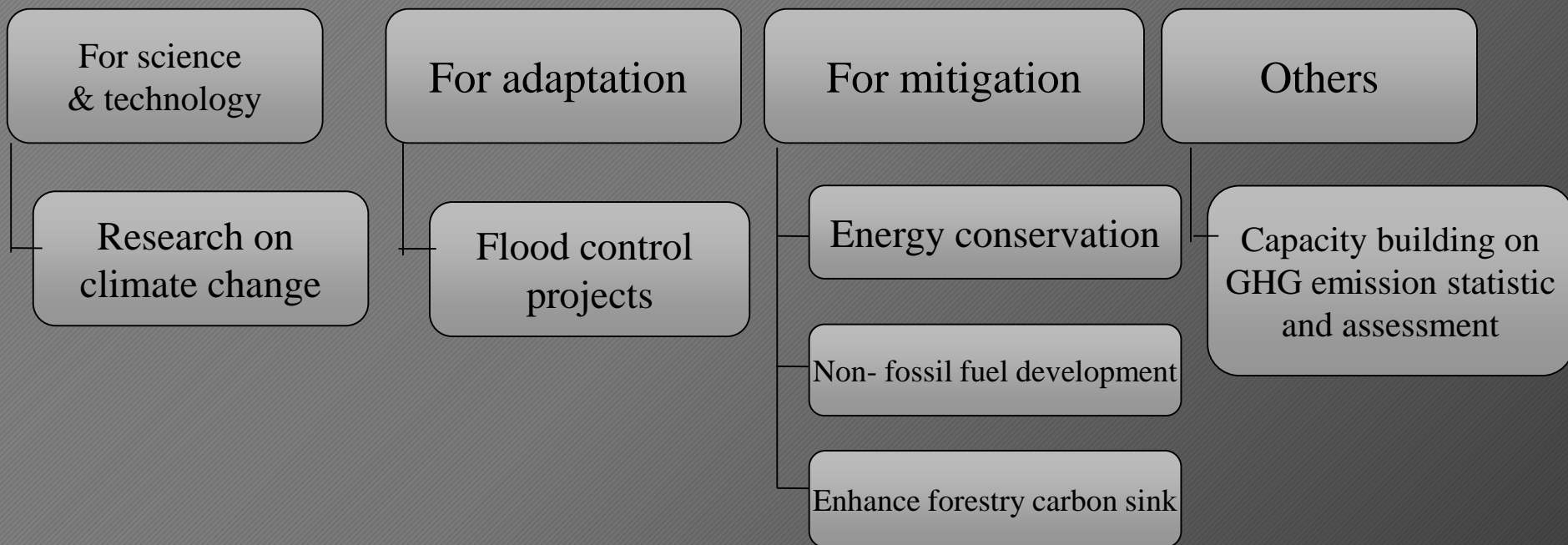
- Suggestions on enhancing Climate Change statistics

5. Governmental Arrangement

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│   Measurement,          │
│   metrics and verification │
└─────────────────────────┘
          │
          ├──┌─────────────────────┐
          │  │ Common metrics for  │
          │  │ GHG emissions       │
          │  └─────────────────────┘
          │
          └──┌─────────────────────┐
             │ Identification of   │
             │ low-carbon products │
             └─────────────────────┘
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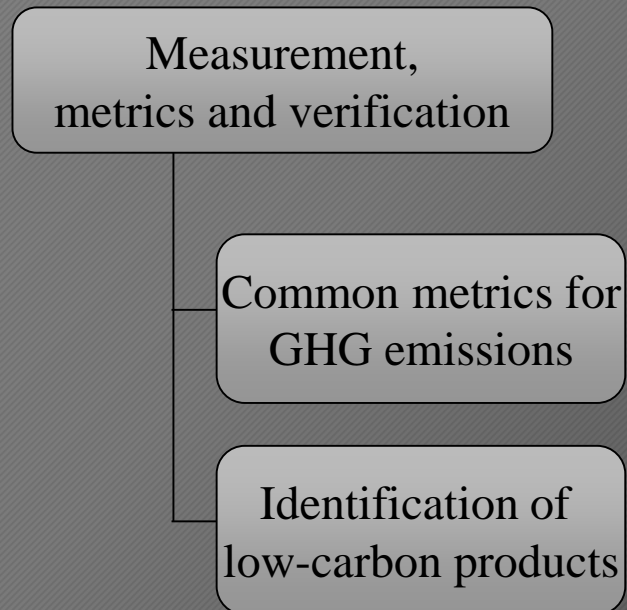
- Suggestions on enhancing Climate Change statistics

Improve the basis for climate change statistics

- Energy Sector: energy balance table, industrial enterprises, transportation, building sector, etc.

- Industry: F- gases, etc.

- Agriculture

- Land use change and Forestry

- Waste

- Suggestions on enhancing Climate Change statistics

Establish administration system for climate change statistics

- GHG emission statistics and assessment system

- Climate change Data publishing system

- Management system for the using of climate change basic statistic data

- Suggestions on enhancing Climate Change statistics

Ensure the implementations

- Clear assignment of responsibilities

- Implement the financial support

- Enhance capacity building

Efforts to strengthen the domestic MRV system

- In 2020 reduce CO_2 emission per GDP by 40~45% relative to 2005 level

- China's 12th 5-year Plan (2011~2015): 17% reduction in carbon intensity;

- Accordingly, provincial targets have been set.
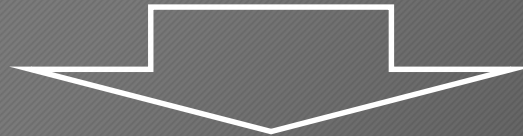
Climate Change Statistics and Assessment System

Carbon intensity reduction targets for 2011~2015

National Target			17%	Hainan	11%
Beijing	18%	Zhejiang	19%	Chongqing	17%
Tianjin	19%	Anhui	17%	Sichuan	17.5%
Hebei	18%	Fujian	17.5%	Guizhou	16%
Shanxi	17%	Jiangxi	17%	Yunnan	16.5%
Inner Mongolia	16%	Shandong	18%	Tibet	10%
Liaoning	18%	Henan	17%	Shaanxi	17%
Jilin	17%	Hubei	17%	Gansu	16%
Heilongjiang	16%	Hunan	17%	Qinghai	10%
Shanghai	19%	Guangdong	19.5%	Ningxia	16%
Jiangsu	19%	Guangxi	16%	Xinjiang	11%

Many Thanks!

ZHANG Xiaohua,   xzhang.ncsc@outlook.com
QI Yue,   qiyue@ncsc.org.cn