Gearing the Philippine Statistical System Towards the Measurement of the Impact of Climate Change

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Outline of Presentation

1. Introduction / The Philippine Statistical System
2. A Glimpse of Social, Economic and Environment Statistics in the Philippines
3. Issues and Concerns in the Generation of Statistics on Impact of Climate Change – Philippine Setting
4. The Way Forward: Mainstreaming Climate Change and Related Statistics into the Official Statistics of the Philippines

INTRODUCTION

Climate Change Impacts in the Philippines

- **The Philippines considered as one of the climate hotspot due to:**
  - ✓ **Geographical Features**
  - ✓ **Low level of economic development**
  - ✓ **Exposure exacerbated by poor access to resources.**

- **Evidence of climate change in the Philippines:**
  - ✓ **frequent occurrence of severe El Niño and La Niña events** ***(7 El Niño & 5 La Niña episodes from 1970-2000 compared to 2 El Niño & 3 La Niña episodes from 1950-1970)***
  - ✓ **deadly and damaging typhoons (*7 extreme tropical cyclone/southwest monsoon induced extreme events from 1991 to late 2004)***

- ✓ **Fall in agric. prod. experienced during strong El Niño events and after occurrences of severe tropical cyclones *(highest typhoon damage: 1.17% of GDP and 4.21% of agriculture)***
- ✓ **Massive coral bleaching in various reefs caused by elevated sea temperature during the severe 1997-98 ENSO episode**
- ✓ **Severe red tide outbreaks after the strong El Niño periods (*worst incidence of red tide in Manila Bay occurred in 1992*).**

Philippines ranked 4th in the Global Risk Index for 2006 (Germanwatch)

Objectives of the Paper

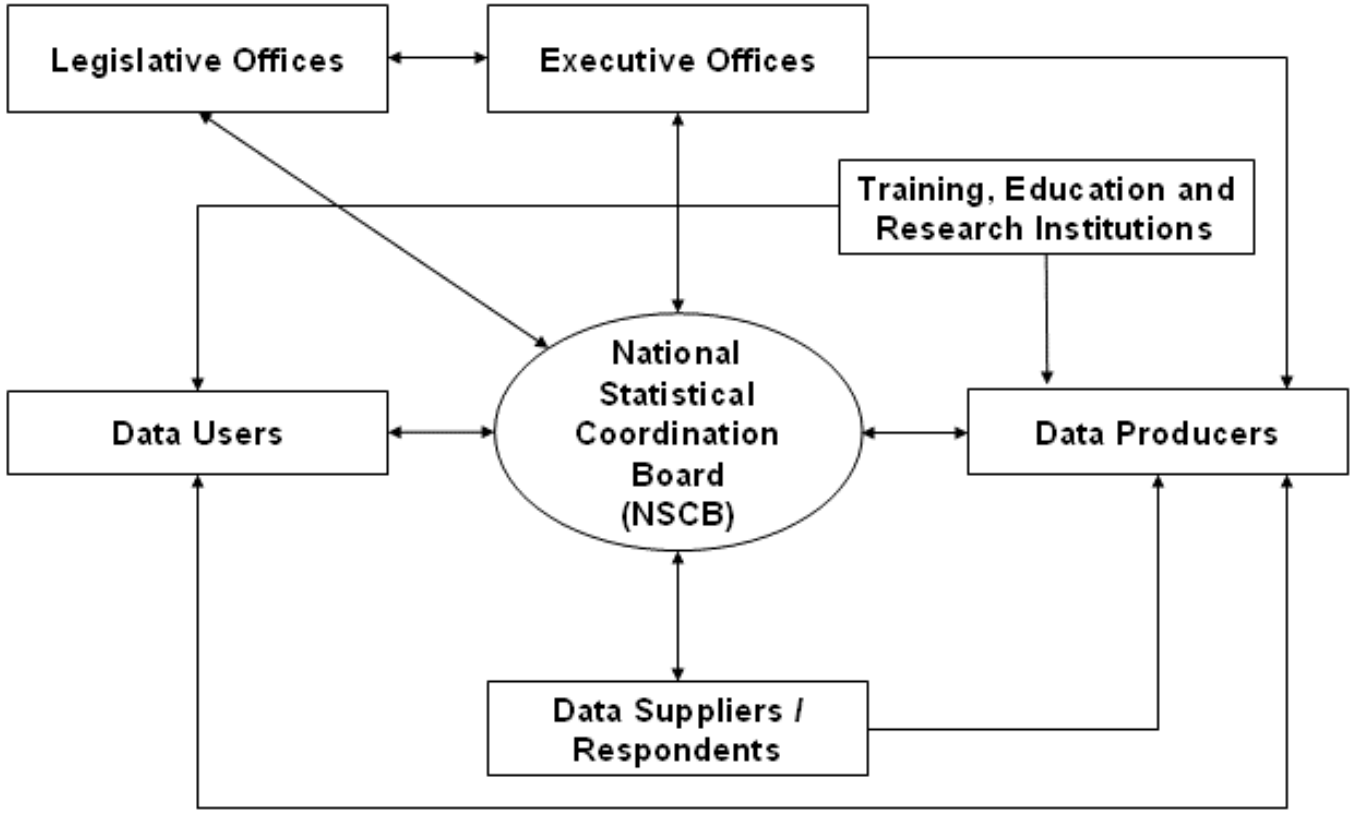
- To present the mechanisms and structures available that can strengthen the involvement of the Philippine Statistical System (PSS) in the measurement of the social impacts of climate change.
- To discuss the challenges facing the PSS in this direction.
- To present a rough framework on indicators on climate change plus some statistics that are already available, both official and non-official.

The Philippine Statistical System (PSS)

*a **decentralized** system composed of:*

- **a policy making and coordinating body**
- **a general purpose statistics producing agency**
- **a statistical research and training center; and**
- **all government agencies engaged in the generation of statistical information**

Framework and How It is Coordinated



Existing PSS mechanisms that would be useful in the generation of official statistics for measuring the social impacts of climate change:

a. **Philippine Statistical Development Program (PSDP)**
b. **System of Designated Statistics (SDS)**
c. **Budget Review and Prioritization**
d. **Statistical Survey Review and Clearance System (SSRCS)**
e. **Statistical Standards and Classification Systems**
f. **Technical and Inter-Agency Committees on Statistics (TCs/IACs) and Task Forces (TFs)**

g. **Development and Maintenance of Statistical Frameworks and Multi-Sectoral Indicator Systems**
   - **Philippine Framework for the Development of Environment Statistics**
   - **Philippine Economic-Environmental and Natural Resources Accounting**

h. **Performance Measurement Scheme for Statistical Agencies and Other Data Producers**

i. **Joint PSS Programs (e.g., NSM, NCS)**

j. **Users' Forum**

2. Socio-econ and Environment Statistics in the Philippines: Agriculture and Food Security

Indicator	Manner of Data Dissemination	Frequency	Data Source/Agency
AGRICULTURE AND FOOD SECURITY			
1. Supply and demand of agricultural commodities	Publication, website, press release	Annual	NSCB (FBS)
2. Food sufficiency ratio by type of food commodity			
3. Area planted/area harvested to palay, corn and other crops	Publication, website	Quarterly, Annual	BAS
4. Productivity (e.g., yield per hectare) - Palay, Corn, etc.			
5. Livestock and Poultry Volume of Production and Growth Rates			
6. Fishery Value of Production and Growth Rates			

Human Settlements and Society

Population count	Web release, Publication, CDs, Public Use Files	Every census year	NSO - CPH
Age and sex structure	Web release, Publication, CDs, Public Use Files		
Population density			
Population in urban and rural areas			
Population growth rate by province			
Rates of in- and out-migration			NSO (NDHS)
Net migration rate			
Origin-destination matrix by province			NSO (Survey of Overseas Filipinos)
Rates of emigration and immigration			Special Subject Survey on Migration
Net international migration			
No of overseas Filipinos			Migration Information Centers in the LGUs
Countries of origin and destination			
Proportion of families with housing units made of strong materials	Publication/Website	Every three years	NSO - FIES
	Publication/Website	Every non-FIES year	NSO - APIS
	Publication/Website	Every 10 or 5 years	NSO – CPH
Proportion of households living in makeshift housing	Publication & Website	Every three years	NSO - FIES
		Every non-FIES year	NSO - APIS
		Every 10 or 5 years	NSO - CPH
Proportion of families/households with access to safe water supply		Every three years	NSO - FIES
		Every non-FIES year	NSO - APIS
		Every 10 or 5 years	NSO - CPH
Proportion of families with access to sanitary toilet facilities		Every three years	NSO - FIES
		Every non-FIES year	NSO - APIS
		Every 10 or 5 years	NSO - CPH
Subsistence incidence		Every 3 years	NSCB
Poverty incidence			NSCB
Human development index (HDI)			NSCB/HDN

Health Statistics

Life expectancy	Publication	Annual	NSO
Crude death rate			
Infant mortality rate	Web release, Publication, CD, Diskette	Every 5 years	NDHS, NSO
Child mortality rate			
Under-five mortality rate			
Maternal mortality ratio	Publication	Varying	NDHS, NSO
Incidence of specific notifiable diseases		Annual	DOH
Causes of morbidity			
Prevalence and death rates associated with malaria			
Prevalence and death rates associated with tuberculosis			

3. Issues/Challenges in the Generation of Statistics on Social Impacts of Climate Change – Philippine Setting

- **On Framework and Indicator Systems**
  - ✓ ***Need for a Climate Change Framework and Indicator System***
  - ✓ ***Need to pursue and update Disaster Management Indicator System (DMIS), PEENRA system, and other existing relevant statistical frameworks***

- **Data Problem**
  - ✓ **Data on climate change are few**
  - ✓ **Challenges:**
    - » **Lack of statistical framework**
    - » **Data cuts across different sectors and requires expertise which official statisticians generally do not have, costly**
    - » **Data needs to be more specific to location and time of observation**
    - » **Data must typically span longer time intervals for observation**
    - » **Requires standards to measure the impact, adaptation and mitigation of climate change.**

On Institutional Coordination, Linkages and Capability Building

- ***Need to Strengthen Institutional Linkages***
  - ✓IAC-ENR has to recommend to the NSCB Board the necessary statistical activities to include researches to be conducted and fund allocation.

- ***Insufficient coordinating structure at the sub national level***
  - ✓A high power inter agency body has to be established to gear regional development efforts in the planning and programming of the generation/compilation of statistics in specific geographical areas

- ***Need to strengthen capability of statistical personnel to undertake and handle statistical researches and other activities related to climate change and its social impact.***
  - ✓ **Formulation of a training agenda at the national and sub-national levels**
  - ✓ **Statistical advocacy to recognize the importance of undertaking researches on climate change**
  - ✓ **Support from the UN agencies, e.g., Statistical Institute for Asia and the Pacific, to enhance the capacity of the PSS to measure the impact of climate change**
- ***Need to to Create Awareness on Climate Change and its Impacts among Statistical Agencies***
  - ✓ **Assistance to statistical agencies and other data producers to understand issue on climate change and identify relevant data and indicators**

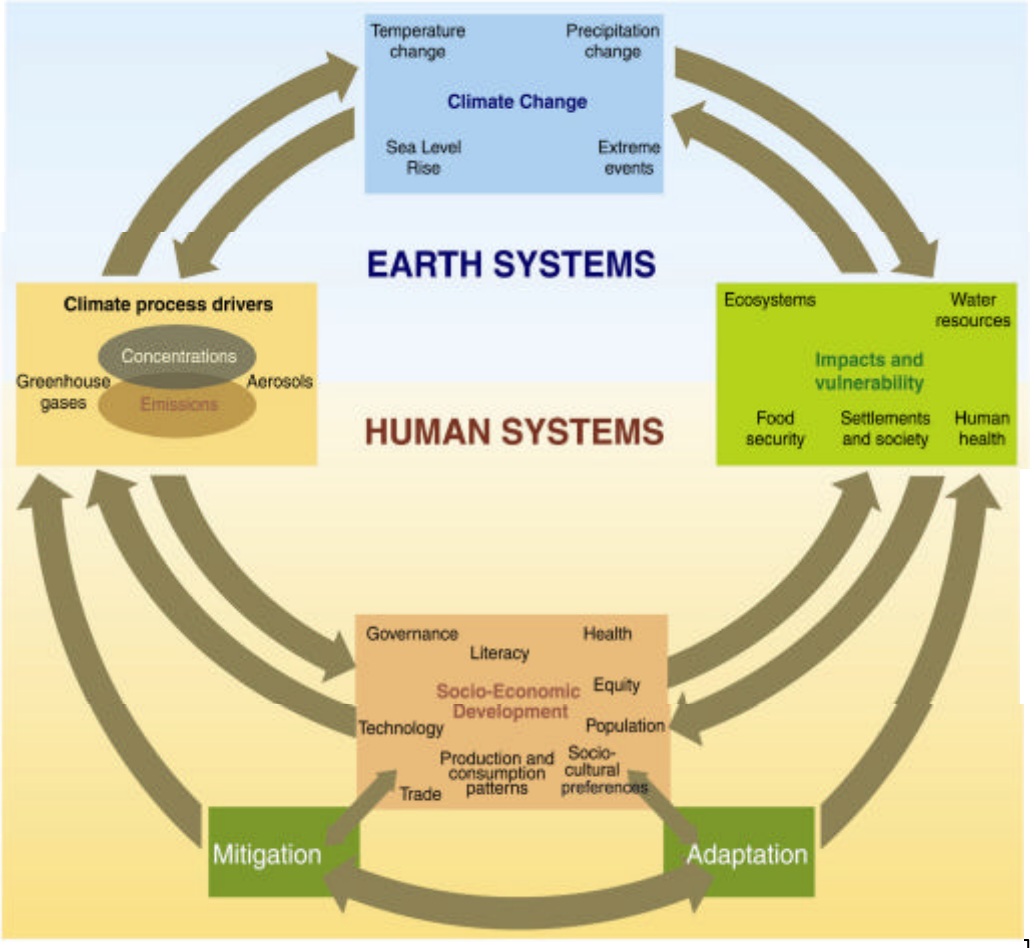
- ***Resources (manpower and financial)***
  - **The PSS lacks the required resources to address issues and challenges presented on a more permanent basis**
  - **National government should formulate a comprehensive study on programs and projects that need funding**
  - **RDC and RSCCs should plan programs and project suited to the particularity of their locale**
  - **The international community has an obligation to support developing countries in adapting to climate change.**

4. The Way Forward: Mainstreaming Climate Change and Related Statistics into the Philippine Official Statistics

- ***Integration of Climate Change Issues into National and Local Development Plan and Policies***
  - **Presidential Task Force on Climate Change seeks to address and mitigate the impacts of climate change in the country.**
  - **The Philippines is in the process of undertaking an improved national GHG inventory and preparing the country's Second National Communication.**
  - **Filing of a bill on Climate Change in the the Phil. Congress**

❑ Development of a Statistical Framework and Indicator System in Measuring/Monitoring Climate Change Impacts

Basis of the rough Statistical framework: AR4's schematic framework on climate and change



Source: Inter governmental Panel on Climate Change, Fourth Assessment Report. Climate Change 2007, Synthesis Report

The Framework:

- **provides a systematic organization of the interdisciplinary nature of climate change statistics and focuses on the identification, description and presentation of data variables useful for tracing and verifying interrelationships and interdependency of the earth and human systems.**
- **pictures the changes in the earth system triggered by climate process drivers, the impacts and vulnerability of earth ecosystems and human system, and the coping mechanism of the human system to climate change.**

Conceptual Framework

Climate Change	Climate Process Drivers	Impacts and Vulnerability	Socio-Economic Development	
			Mitigation	Adaptation
Temperature Change	**GHG Emissions / Concentration sources**	**Ecosystem (terrestrial and Marine)**	**Health**	**Health**
	Industries:	Proliferation, depletion and extinction of species		
Precipitation Change	Transport			
	Cement	Depletion/growth of growth resources	**Technology**	**Technology**
	Metal and non-metallic production		Clean Energy Development Mechanism	Clean Energy Development Mechanism
Sea Level Rise		Introduction of exotic species		
	Chemical and chemical	Changes of habitat/ecosystem		
	paper and pulp			
	etc	**Water Resources (fresh and Marine water)**		
Extreme Events			**Production and Consumption Pattern**	**Production and Consumption Pattern**
	Agriculture/Forestry	Water Depletion		
	Rice and corn production	Water quality		
	Agricultural Residue Burning			
	Grassland/Forest burning/fire	**Food Security/Safety**		
	Agricultural soils	Food Production (crops and fishery)		
			Trade	**Trade**
	Energy/electricity	Occurrence of Harmful Algal	Carbon trading	Carbon trading
	Fossil Fuel Production	Nutritional food Intake		
	Biomass burned for energy	Occurrence of crop/fishery disease and infestation		
	Grassland Burning/Kaingin (slash and Burn)			

	Waste	Human Health	Socio-Cultural preferences	Socio-Cultural preferences
	Solid wastes	Occurrence of Vector borne Diseases		
	Domestics and Commercial Waste Water			
		Occurrence of Skin Diseases		
	Industrial Wastewater	Respiratory Diseases	**Population**	**Population**
	Hazardous Waste	Diarrheal Cases	Population in coastal areas (with gender)	Population in coastal areas (with gender)
	Human Sewage			
		Settlements and Society	Population Growth/Density	Population Density/Density
		Coastal Settlements	Population control Mechanism	Population control Mechanism
		Settlement in hazardous geologic areas		
			Equity	**Equity**
			Poverty Incidence	Poverty Incidence
			Poverty level	Poverty level
			Literacy	**Literacy**
			Governance	**Governance**
			RURBAN land used Planning	RURBAN land used Planning
			Ecological Waste Management Policies	Ecological Waste Management Policies
			Water Resource Management	Water Resource Management
			Disaster Management Mechanisms	Disaster Management Mechanisms

- **Operationally, the framework starts with the topics/items identified in the conceptual framework and proceeds to the identification of specific relevant variables and their corresponding units of measurement needed to quantify the earlier discussed concepts.**
- **The indicator system can commence with existing indicators and variables found in the PFDES, SEEA, poverty, health accounts, etc.**

Statistical Framework, Climate Change

Topic	Variables	Measurement
Temperature Change		
	Climatological Normal (temperature mean, maximum and minimum)	^{o}Celcius
	`- national	
	`- regional	
	Temperature, deviation from seasonal mean	^{o}Celcius
	Rate of Change	
Precipitation Change		
	Amount of rainfall	millimeter
	`annual, monthly	
	` national, regional, and provincial	
	Precipitation, deviation from seasonal mean	mm, km^2
Sea Level Rise		
	Sea level increase (normal - high tide and low tide)	meter
	deviation from normal	meter
Extreme Events		
	El Niño and La Niña	number of occurrence
	Typhoon, hurricane, tornado, locaton, population/areas affected	typhoon signals, Quantity
	Floods, flash floods, locaton, population/areas affected	m, h, km^2, quantity
	Landslides, locaton, population/areas affected	m, h, km2, quantity
	Tidal Waves, locaton, population/areas affected	km^2, quantity

Statistical Framework, Climate Process Drivers Change

Topic	Variables	Measurement
GHG Emissions / Concentration sources		
Industries:	(can be sourced from environemental accounts)	
Transport	total emissions by type of vehicles	tons/year
Cement	total emissions by type of industry	tons/year
Metal and non-metallic production	toxic air contaminants	tons/year
Chemical and chemical products		
paper and pulp		
etc		
AgricultureForestry		
rice and corn production	Rice and corn production	tons/year
	Area of production (provincial, municipal)	Gg
	Total Ghg emission from rice and corn produciton	hectare
Agricultural Residue Burning	Area burned/kaingin areas	hectare
Grassland Burning	Forest Fires	hectare
Agricultural soils		
Energy/electricty		
Fossil Fuel Production	energy resources production (by sector, by utility)	by capacity (gwh)
	Depletion of energy resources	volume (thousand metric tonnes)
	Energy conversion (by plant, utility)	by capacity (gwh)
Biomass burned for energy	Energy Consumption (by sector, source)	by capacity (gwh)
Waste		
Solid wastes	solid waste disposal/ generation	tons per year, kilogram per capita
Domestics and Commercial Waste Water	toxic waste generated	tons per year, kilogram per capita
Industrial Wastewater	waste disposal in landfill	tons per year, kilogram per capita
Human Sewage	Volume of human sewage	tons per year, kilogram per capita
Hazardous Production	volume of hazardous waste	tons per year, kilogram per capita

Statistical Framework, Climate Change Impact and Vulnerability

Topic	Variables	Measurement
Ecosystem (terrestrial and marine)		
Proliferation, depletion and extinction of species	Number/types of extinct, endangered, vulnerable, etc species	
	Number/types of introduced species	
Depletion/growth of growth resources	Forest area cleared for agricultural production	Hectare
	Area harvested/used in kaingin	Hectare
	Volume of log production	Cubic meter/year
	Area of change	Percent change
	Fish Production (marine, inland municipal and aquaculture)	Tons, kg
Changes of habitat/ecosystem	Mangrove areas converted for aquaculture production	Hectare, km^2, pesos
	Loss of Seagrass Beds	
Water Resources (fresh and Marine water)		
Water Depletion	Amount of surface (by source, rivers, lakes) and groundwater abstraction	Cubic meters per year, liters per second
	Amount of surface (by source, rivers, lakes) and groundwater abstraction for use in irrigation, commercial, domestic and industrial	Cubic meters per year, liters per second
	Average stream flow	Cubic meters per second
	(Can be sourced from environmental accounts)	
	Number of sites used for inland, municipal fishery	Number of sites
Water quality	Water quality of receiving water bodies	Concentration (mg/l)
	Number of areas affected by flood	Number, hectares, depth
	Number of rivers, lakes, open waters affected by sedimentation	Number of rivers and lakes affected

Impact and Vulnerability, con't

Food Security/Safety		
Food Production (crops and fishery)	Volume of rice/rice production	kilograms, tons
	Volume of fish production (inland, marine and aquaculture	kilograms, tons
Occurrence of Harmful Algal Blooms (HABS)	Number of occurrence and location	
Nutritional food Intake		calorie
Crop/fishery disease and infestation	Number of occurrence, type of disease and infestation	
Human Health		
Occurrence of Vector borne Diseases	number of occurrence/cases, type, location	
Occuence of Skin Diseases	number of occurrence/cases, type, location	
Respiratory Diseasea	number of occurrence/cases, type, location	
Diarrheal cases	number of occurrence/cases, type, location	
Human Settlements		
Coastal Settlements	Population size, density, dissagregation (male and female)	
Settlement in hazardous geologic areas	Population size, density, dissagregation (male and female), location	

Statistical Framework, Socio-Economic Development - Mitigation and Adaptation

Topic	Variables	Measurement
Health		
Technology		
Clean Develoment Mechanis		
Production and Consumption Pattern		
Trade		
Carbon trading		
Socio-Cultural preferences		
Population		
Population in coastal areas (with gender)		
Population Gorwth/Density		
Equity		
Poverty thresholds		
Poverty level		
Literacy		

- **The framework needs further development as researches on climate change and its impacts become available.**

Designation of Climate Change Statistics

- The list of designated statistics has to be reviewed to include climate change impact and ENR statistics/indicators
- The current designated statistical activities, e.g., field health service information system, energy and water, etc., have to updated to include salient features of climate change impact statistics

❑ Standards and Classification System

- **IAC-ENR can select the terms from existing laws which have statistical bearing for approval of the NSCB Executive Board for adoption as official climate change/ENR terms to be use for statistical purposes.**
- **PSS can lay down the standard methodologies and techniques in data collection, processing and presentation to ensure comparability of statistics produced by the government.**

❑ Partnership Among Gov't Agencies, Academe and Research Inst's for Continuous Improvement of Climate Change Statistics

- **Statisticians to collaborate with other scientists to advance their understanding on the nature, causes, and impacts of climate change**
- **Government can gear its science and technology research towards climate science and climate change impact.**
- **Different government agencies, national and local, should involve research institutions and academe in formulation of plans and programs on climate change.**

❑ Research and Training

- SRTC can develop a comprehensive and integrated research and training program on theories, concepts and methodologies in climate change and its impact.
- Key specific research priorities might deal on:
  - ✓ Enhancing capability to establish and maintain observation facilities and to collect, and compile climate, social and biophysical data;
  - ✓ Measuring impacts of extreme weather events, i.e., human diseases from flood, storm surges, sea level rise, plant and insect pests;
  - ✓ Identification of social vulnerability to multiple stressors due to climate change environmental change
  - ✓ Identification of critical climate thresholds for various sectors in different locale

Maraming salamat po!

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