ENVIRONMENTAL ACCOUNTING IN VIETNAM

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OUTLINE OF PRESENTATION

- Introduction
- Some main achievements of National account of Viet Nam
  - SNA
  - SEEA
- Future forward

INTRODUCTION

- Centralized Vietnam Statistical System is centralized one, including three levels: Center statistics; provincial statistics and district statistics.
- To collect information, GSO of Vietnam has based on the statistical system from the centre to the provinces and districts and line ministries.
- SNAD is a department of GSO
- Apply SNA since 1993

LEGAL BASIS

1. Statistics law (2004),
2. National statistics indicator system was stipulated by Prime Minister

   21 groups of indicator,350 indicators; Green GDP; Group of Environment Protection, including 24 indicators
3. Vietnam Statistics Development Strategy

   9 action programs

   - Program to improve institutional and legal framework and coordination mechanisms for statistical activities

   - Program to develop human resources in statistical profession

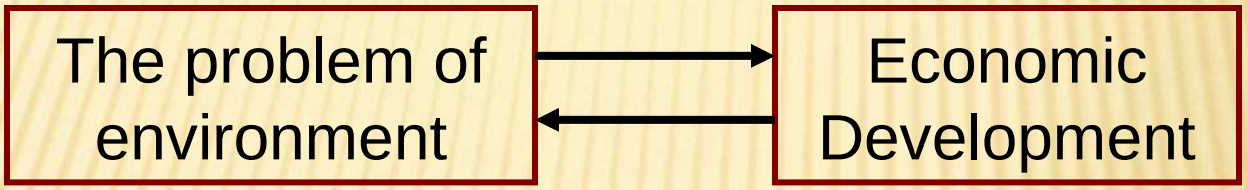
SOME MAIN ACHIEVEMENTS OF NATIONAL ACCOUNT OF VIET NAM

1. **GDP is calculated by three approaches**
2. **Consolidated Accounts**
   - Production Account;
   - Generation of Income Account;
   - Allocation of Primary Income Account;
   - Secondary Distribution of Income Account;
   - Use of Disposable Income Account.
3. **Input - Output table**

   IO tables for the year 1989, 1997, 2000, 2007 (conduct 2012, finished 2014)

ENVIRONMENTAL ACCOUNTING

1. Vietnam's economy achieved high growth rates in recent decades sustainable development problem posed



2. The need to compile 3 accounts:

1. Resources Account;
2. Environmental pollution Account;
3. Public Expenditure Account for the environment.

HYBRID INPUT – OUTPUT EXTENDED

$$\begin{pmatrix} X \\ W \end{pmatrix} - \begin{pmatrix} A & \text{Q1} \\ V^{*} & \text{V}^{*}1 \end{pmatrix} \begin{pmatrix} X \\ W \end{pmatrix} + \begin{pmatrix} Y \\ Q\,2 + g \end{pmatrix}$$

$$\begin{pmatrix} (I - A) & \text{- Q1} \\ -V^{*} & (\text{I - V}^{*}1) \end{pmatrix} \begin{pmatrix} X \\ W \end{pmatrix} = \begin{pmatrix} Y \\ Q\,2 + gY \end{pmatrix}$$

V* is matrix of the amount of pollutants generated per (currency) unit of output of each sector.
V*1 is matrix of direct residuals coefficient generated by abating activities
Q1 is matrix of expenditure *essential* of sector i for abating the residual type j
Q2 is vector of residial from other resource
g is the mxn direct pollution coefficient matrix of final uses, which shows the amount of residuals (in physical units) generated per unit of product (monetary units) consumed by households.
W: Total residual j, including residuals from both production and non-production activities; the part of W is amount pollutant that need to abate

HYBRID INPUT – OUTPUT EXTENDED

$$\begin{Bmatrix} X \\ T \end{Bmatrix} = \begin{Bmatrix} (I - A - CT)^{-1} & BCK \\ KVB & K \end{Bmatrix} \begin{Bmatrix} X \\ T \end{Bmatrix} \begin{Bmatrix} f \\ g \end{Bmatrix}$$

X is a vector of output

T is a vector of total income, it includes income from production and outsize of production (property income and transfer income); T also may be a matrix of income groups,

A is sub-matrix of direct intermediate input;

V is a matrix of value added ratios of income groups;

C is a corresponding matrix of consumption coefficients,

f is a vector of final demand except household consumption, g is a vector of exogenous income of income groups. Sonis and Hewings (1993) extended this framework using the following perspective:

HYBRID INPUT – OUTPUT EXTENDED

- $B = (I-A)^{-1}$ is the Leontief inverse matrix
- $(I-A-CT)^{-1}$ is an enlarged Leontief inverse matrix; the elementary of this matrix includes direct impact, indirect impact and induces effects from household consumption. They contain elements that are larger than those of the $(I-A)^{-1}$ matrix, because they include extra output required to meet the consumption.
- BCK is a consumption multiplier matrix
- KVB is an income multiplier matrix
- K is a matrix of the Miyazawa inter-relational income multipliers

HYBRID INPUT – OUTPUT EXTENDED

$$U = \begin{pmatrix} (I - A - CT)^{-1} & BCK \\ KVB & K \end{pmatrix}$$

$$\begin{pmatrix} X \\ T \end{pmatrix} = U \begin{pmatrix} f \\ g \end{pmatrix}$$

$$E = Ej \; .U \begin{pmatrix} f \\ g \end{pmatrix}$$

E is a matrix of value of emission by production and consumption and Ej is a matrix of emission coefficient that was discharged by economic activity household consumption

"GREEN GDP"

- Green GDP is indicator that has meaning when we consider all production impacts that are not usually reflected in calculating the value of basic GDP: It is equal to net supply of production (i.e. GDP based on the production approach), less the total cost of production for abating residuals (including: expenditure for abating pollution, output of exploitation sector, expenditure for using land, expenditure for putting in order cultural relics damaged, expenditure for people suffering from professional diseases, expenditure for re-training employees and expenditure for capital loan from the rest of the world), and less the total expenditure for abating residuals from other sources and from household consumption.

$$GGDP = GDP - \Omega$$

EMPIRICAL STUDY

- Using I/O table of Vietnam:
  - 2005 and 2007 at 2005 price (2005 constant price)
- Data on CO2 emission:
  - http://earthtrends.wri.org

EMPIRICAL STUDY

- **Number of sector: 5 sectors**
  - Electricity
  - Energy
  - Manufacturing and construction
  - Transportation
  - Others

TABLE 1. ELECTRICITY REQUIREMENT FOR A UNIT INCREASING OF FINAL PRODUCTS IN 2005 AND 2007

	2005			2007		
	total impact	**direct**	**indirect**	**total impact**	**direct**	**indirect**
Electricity	1.07864	0.05894	1.01970	1.16910	0.13803	1.03107
Energy	0.05314	0.03972	0.01342	0.02180	0.01050	0.01130
Manu. & Construc.	0.06111	0.01921	0.04190	0.04841	0.01285	0.03556
Transportation	0.02761	0.00380	0.02381	0.02166	0.00321	0.01845
others	0.03018	0.01268	0.01750	0.03219	0.01525	0.01694
Total	**1.25070**	**0.13436**	**1.11634**	**1.29315**	**0.17983**	**1.11332**

TABLE 2. ENERGY REQUIREMENT FOR A UNIT INCREASING OF FINAL PRODUCTS IN 2005 AND 2007

	2005			2007		
	total impact	**direct**	**indirect**	**total impact**	**direct**	**indirect**
Electricity	0.18614	0.14514	0.04100	0.13036	0.08822	0.04213
Energy	1.08802	0.05681	1.03121	1.10989	0.07007	1.03982
Manu. & Construc.	0.12413	0.03396	0.09018	0.10198	0.02369	0.07829
Transport ation	0.27321	0.22494	0.04828	0.43869	0.36069	0.07800
others	0.07950	0.04008	0.03942	0.06353	0.02710	0.03643
Total	**1.75101**	**0.50092**	**1.25008**	**1.84445**	**0.56977**	**1.27467**

TABLE 3. THE CO2 EMISSION IN 2007

	2005	2007	Change
Electricity	11.95	17.85	149.3%
Energy	0.29	0.19	66.0%
Manu. & Construction	15.02	20.88	139.0%
Transportation	12.43	19.47	156.6%
Others	5.14	6.46	125.7%
Household consumption	3.17	4.18	132.0%
Total	**48.00**	**69.02**	**143.8%**

CO2 EMISSION INDUCED BY FACTOR OF FINAL DEMAND

	C	I	E	Total
Electricity	60.34%	11.99%	27.67%	100.00%
Energy	3.06%	0.20%	96.75%	100.00%
Manu. & Construction	24.50%	22.98%	52.52%	100.00%
Transportation	49.02%	15.27%	35.70%	100.00%
Others	48.93%	17.53%	33.54%	100.00%
Total	**43.96%**	**17.05%**	**38.98%**	

FINDING

- In three years from 2005 – 2007 the economic growth was fast but not suitable. The electricity sector lost a lot in the production process while this sector has the growth on CO2 to be very high.
- The electricity was caused electricity requirement increase due to loss on the production process.
- export energy is not only loss the resource of the Nation but also causing CO2 emission high
- GDP has increased by 17.4% from 2005-2007 while CO2 emission has increased by 43.8%, about 2.5 times the GDP growth rate.

FUTURE PLAN

Period of 2011-2015

Main activities

- Complete policy mechanism
- Raising capacity of Vietnam statistical system (Building of parts of implementation, training, cooperation with other domestic and foreign organizations...)
- Establish information systems, national environmental data
- Calculate and issue Green GDP
- Prepare test for some main account of SEEA (water account, and oil account, coal account, etc)
- Seminar, reporting and dissemination and propagate the main result of the phase I and building a program plan for the next period.

FUTURE PLAN

Period of 2016-2020

Main Activities

- Preparation of the work and the conditions necessary for compiling SEEA test.
- Complete information source, method to compile SEEA
- Official compiling and publish SEEA account in 2020.
- Base on information of environment, and SEEA to analysis, to assess, forecast and international compare of environmental.

GENERAL STATISTICS OFFICE OF VIETNAM

Thank you very much for your attention

Website: http//gso.gov.vn