

Discussion Paper No. 02/2004

**Regional Development Perspectives in Vietnam
- Insights from a 2002 Provincial
Social Accounting Matrix (SAM)**

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**Forschung zur Entwicklungsökonomie und –politik
Research in Development Economics and Policy**

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Discussion papers in this series are intended to stimulate discussion among researchers, practitioners and policy makers. The papers mostly reflect work in progress. The author is grateful to the reviewers Prof. Dr. Dr. h.c. Franz Heidhues (University of Hohenheim), Dr. Peter Wobst and Holger Seebens (both Centre for Development Research, Bonn).

We gratefully acknowledge contributions from the Father and Son Eiselen - Foundation, Ulm, towards the printing costs.

Clemens Breisinger, Franz Heidhues:

Regional Development Perspectives in Vietnam - Insights from a 2002 Provincial Social Accounting Matrix (SAM).

Institute for Agricultural Economics and Social Sciences in the Tropics and Subtropics (Ed.),
Forschung zur Entwicklungsökonomie und -politik - Research in Development Economics
and Policy, Discussion Paper 02/2004.

ISSN 1439-4952

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Printed in Germany.

Druck: F. u. T. Müllerbader GmbH
Forststr. 18, 70794 Filderstadt, Germany

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Abstract

Growing regional disparities in Vietnam have encouraged plans to extend the national Comprehensive Poverty Reduction and Growth Strategies (CPRGS) to the provincial level. The northern mountainous province of Son La has distinctive development perspectives. It was selected as the site of Vietnam's planned biggest dam and hydroelectric power plant. Large-scale infrastructure investments are expected to contribute to economic growth and poverty reduction in the region. The impacts of these investments on the regional economy can be assessed with a multiplier model based on a regional social accounting matrix (SAM). In this paper, we present a 2002 SAM for Son La. To shed light on the socioeconomic situation, we review insights from this detailed database. A SAM-based multiplier model is then put forward to examine linkages within the provincial economy and to present first results of demand-side effects of infrastructure investment in the local construction sector.

Keywords: SAM, Multipliers, Province, Vietnam, Development.

Abbreviations

CPRGS	Comprehensive Poverty Reduction and Growth Strategy
CU	Currency Unit
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GRP	Gross Regional Product
GSO	General Statistics Office
IC	Intermediate Consumption
PIP	Public Investment Program
ROV	Rest of Vietnam
ROW	Rest of the World
SAM	Social Accounting Matrix
SNA	System of National Account
VA	Value Added
VHLSS	Vietnam Household Living Standard Survey
VND	Vietnam Dong

Exchange rate: 1US\$=15250 Vietnamese Dong (VND)

Regional Development Perspectives in Vietnam – Insights from a 2002 Provincial Social Accounting Matrix (SAM)

Clemens Breisinger, Franz Heidhues

1. Introduction

Vietnam's economic reforms have led to sustained economic growth and poverty reduction over the past two decades. At the same time, however, large regional disparities persist, with a poverty rate in the north-western mountainous region of 68% compared to a national average of 28,9%. In order to lay the foundations for concerted regional action, there are plans to roll out the national Comprehensive Poverty Reduction and Growth Strategies (CPRGS) to the provincial level (Joint Donor Report, 2003). Within the same initiative, poverty and distributional aspects take root within public investment programs (PIP). The mountainous province of Son La illustrates the advantages of such regional and project-based approaches and how different local perspectives can be. It is one of the poorest provinces in Vietnam with an average per capita income of 150 US\$/year (GSOSL 2003/1) and a rural population share of 90%. But contrary to comparable provinces, Son La is expecting massive investment for the years 2005-2015. The nationwide economic boom has led to a massively increased demand for energy and the province was selected to be the site for a large hydroelectric power plant. Total public investments are estimated to represent a sum worth 15 times the annual provincial GDP. Obviously, with such a large investment program, an efficient and poverty-oriented allocation concept is needed to gear these investments into a pro-poor growth process and thus contribute effectively to poverty reduction.

The University of Hohenheim is cooperating with the Hanoi Agricultural University, the Thai Nguyen University of Agriculture and Forestry, Vietnam Agricultural Science Institute and the National Institute of Animal Husbandry in a long-term interdisciplinary research program aimed at developing innovations that can contribute to sustainable land-use practices and rural development activities in the mountainous regions of Northern Vietnam. This research known in Vietnam under "The Uplands Program" is focussed on Son La province, i.e. the region where most of the public investments of the hydroelectric dam are implemented. It is to be expected that these investments will fundamentally transform the region and its economy. The SAM framework, on which this research is based, offers an opportunity to capture the status quo before the far reaching change processes are set in

motion. Thus, it is fundamental for evaluating in later years the impact of changes and innovations initiated and developed under the Uplands Program.

Tools for regional economic analysis can serve as a basis for the planning of provincial CPRGS and can thus contribute to the question of how to integrate public investment patterns into poverty and distribution-oriented development strategies. As an extension of input-output tables, the social accounting matrix (SAM) has become a widely accepted tool among national as well as regional economists (Isard 1998). A SAM sheds light on the structure of the economy, revealing linkages between production activities, commodities, factor markets and institutions. However, the use of SAMs at the regional level is often restricted by insufficiencies of data availability. When applied to sub-national levels SAMs often rely on highly aggregated local data and national averages (IFPRI, 2003).

This paper has two objectives: firstly, the SAM analysis aims at shedding light on the economic structure of Son La province. Secondly, we make a first step towards using SAM-based models as socio-economic appraisal tools for large-scale projects by using SAM multipliers. The structure of the paper is as follows; in section 2, the estimation process of the provincial SAM is presented, including a small discourse on the use of provincial and national average input- output data. This is followed by a descriptive analysis of the SAM. In section 3, a basic output multiplier model in the tradition of Pyatt and Round (1985) is put forward and applied in section 4 to estimate the impacts of additional final demand for construction activities.

2. The 2002 SAM for Son La Province

2.1 The SAM Estimation Process

A SAM is a particular representation of the macro and meso-economic accounts of a socio-economic system, which capture the transactions and transfers between all agents in the economy. The logic behind the system basically resembles the principle of double entry bookkeeping. The SAM has a square tabular format, where entries along the row represent incomes and entries along the columns expenditures of a particular account. Total income and total expenditures of the same accounts are always equal. Detailed description of the SAM framework can be found e.g. in Pyatt and Round (1985) and Reinert and Roland-Holst (1997).

On the national level, many SAMs have been constructed to serve as basis for a wide range of impact analyses (e.g. Tarp et al 2002, Wobst 2001). Even though the framework is equally suitable for the regional and provincial levels, examples of such SAMs are limited in developing as well as developed countries. This is mostly due to data limitations. In this

context, Isard et al (1998) describe “hybrid” SAMs as models that combine secondary data available at the regional level with national account data in order to compensate for the lack of regional data. In this context, a simple mean average analysis for Son La province reveals that the overall provincial intermediate consumption (IC) is 19% lower when comparing provincial data with national average data. Interregional production structures tend to vary significantly. The estimation of provincial SAMs in developing countries thus poses challenges as well as offering advantages compared to their nation or region-wide counterparts. Advantages include the relatively simple structure of the economy and the fact that major import goods are easily identifiable due to the lack of regional production as demand-supply ratios (machinery, fuel, fertilizer etc. in the case of Son La). Moreover, export goods are often limited to primary products. Due to the small number of enterprises in key sectors, enterprise data can be directly incorporated in the SAM. Data used for the macro SAM construction include the Statistical Yearbook of Son La (GSOSL 2003/1), the Yearbook of Commercial Statistics for Son La (GSOSL 2003/4), and the Tableau of Provincial Intermediate Consumption and Value Added Data (GSOSL 2003/5). A detailed description of single cell entries of the macro SAM can be found in the annex.

Table 1 2002 Macro SAM for Son La

	Act	Com	Fac	HH	Ent	GOV	S&I	ROW	TOTAL
Activities		3852808							3852808
Commodities	1342028			1937449		623163	902099	552928	5357667
Factors	2466332								2466332
Households			2114667		106256	9579			2230502
Enterprise			210692			34732			245424
Government	44448		22271	7951	69537			1070633	1214840
Savings & Investment				285102	69631	547366			902099
Rest of the World		1504859	118702						1623561
TOTAL	3852808	5357667	2466332	2230502	245424	1214840	902099	1623561	

Source: Own table. Units in Mio. Vietnamese Dong (VND)

Main economic aggregates are directly available from the macro-SAM (table 1): provincial gross output in 2002 was 3,85 trillion VND or 253 Mio. US\$, GDP at factor cost amounted to 2,47 trillion VND or 162 Mio. US\$. With a total population of 941.901, the

result is an annual GDP/capita of 172 US\$. Investment amounts to 0,9 trillion VND, household consumption to 1,94 and intermediate consumption of 1,34 trillion VND.

To gain more insights into distributional aspects within production activities, consumption patterns and institutions, a more disaggregated structure is required. Therefore the macro SAM is disaggregated into 25 provincial production activities, 29 commodities, 3 factor types, 2 household groups and 3 enterprise types. The government receives income from 2 tax accounts and the rest of the world is differentiated in terms of national and international. Even though the locally provided data covered a lot of the necessary ground, it is obvious that imbalances do occur in micro-SAM building. Various methods of SAM balancing exist, ranging from simple iteration procedures (RAS technique¹) to more elaborated algorithms like cross entropy methods². A third method is based on the modeller's knowledge of the local economy that allows him or her to adjust cell values within the SAM in order to balance rows and columns (Isard 1998). For the present provincial SAM, the latter approach is preferred for previously mentioned reasons: the economy is relatively simply structured, trade can be assumed for the most part as supply- demand ratios and enterprises data can be used to substantiate adjustment decisions. When making adjustments this way, one starts at the top left of the SAM table, pushing the imbalances to the bottom right. Activity rows and columns balance in the case of Son La dataset. The assumption of supply-demand equalization via trade balances the commodity accounts. The result of this estimation process is a fully balanced SAM for Son La province. The setting up of activity, commodity, factor, savings and investment and institutional accounts is discussed subsequently. The SAM relies mostly on data supplied by the Statistics office in Son La. However, some hybrid model features are applied due to the lack of local data. Data used include the Statistical Yearbook of Son La (GSOSL 2003/1), the Yearbook of Commercial Statistics for Son La (GSOSL 2003/4), the Agricultural Yearbook for 2000 (GSOSL 2001), the Tableau of Provincial Intermediate Consumption and Value Added Data (GSOSL 2003/5), the National Input-Output Table for 2000 (GSO 2003), the VLSS for the years 1997/1998 (GSO 1998), and the preliminary data survey of the VHLSS 2002 (GSOSL 2003/9). Single account entries are subsequently presented; the full 2002 micro SAM can be found in the annex.

¹ For more information see e.g. Isard et al. (1998).

² Cross entropy methods combine features of RAS with modeler's based decisions. See e.g. Robinson, Cattaneo, El-Said (2000).

Activities-Commodities: Marketed production

Gross output for Son La province is available for 43 sectors, including 12 agricultural, 3 forestry, 3 fishery, 16 industrial (incl. mining) and 19 service sectors (GSO 2003/1). An aggregation of those sectors yields the 25 sectors of the micro SAM.

Commodities-Activities: Intermediate consumption

Data for Son La exist for 2002 on intermediate consumption by 20x4 sectors, a higher level of aggregation than the 25-sector classification of the provincial SAM. When disaggregating intermediate consumption, an important step is therefore the apportionment of intermediate consumption across the 25 activities. Intermediate consumption data aggregates manufacturing to one single account. For disaggregation we rely on output shares of the relevant manufacturing activities and calculate their respective IC share from national average. The disaggregation of the 4-activity vector to 25 activities is a more demanding task. Again, we rely on the national 2000 I/O classification (GSO 2003/1) of intermediate consumption. In this process the values of the local 4- sector vector (the respective provincial sub-sector totals) and the 112x112 national vectors are used to fit the provincial production structure. This is possible since the I-O accounting methodology on the provincial level resembles the one on the national level and is based on SNA 1998. Intrasectoral intermediate input use might vary on the provincial and national level. This variation within the 4 sector vector is assumed not to significantly influence the results.

Commodities-Households: Private consumption

Household surveys in Vietnam exist for the years 1992/93, 1997/98. The VHLSS for the year 2002 was in process at the time of writing. However a preliminary, if aggregated, version of the latest 2002 VHLSS for Son La province, including about 100 representative households was available to our study. It allows for the disaggregation into two types of households, namely rural and urban. Creating 2 separate accounts includes home consumption of households. We rely on the VLSS 1998 distribution shares of total household consumption and home consumption between the major commodities to disaggregate the 2002 total VHLSS figure in this respect for the two household types. The consumption of durables could not be considered.

Commodities-State: State consumption

is documented in GSO by 20 sectors (2003/2, p.70ff) and straightforwardly applied to the micro SAM. State consumption of manufacturing goods was disaggregated according to respective output figure shares.

Commodities-Investment/Savings: Investment

Investment defined as net capital formation is defined in GSO (2003/1, p.131) for 20 sectors. Again manufacturing is disaggregated according to output shares. This is a simplifying assumption. However, it is not assumed to affect analytical results, as long as they do not directly deal with investment patterns in manufacturing sub-accounts.

Commodities-ROW: Exports

Exports to ROW are documented in GSO 2003/1, p.162. Data on trade with ROV is based on the preliminary information of GSO. Furthermore, we assume that excess local production is exported to ROV. For accuracy in trade related analysis it is advisable to aggregate ROV and ROW, as data on exports to ROW seem sketchy and incomplete. Further disaggregation of the agricultural accounts sub-sectors will shed more light on sub-sector specific trade flows.

Factors-Activities: Value added

Value Added data is straightforward to apply for labour (including salaries and income from self-employment) and capital, namely in the form of operating surplus, depreciation and production taxes across 20 sectors. Only for the manufacturing sector, no disaggregated data was available, so income was shared out according to the number of employees and capital was distributed to the sub-sectors according to their share of gross output. Operating surplus and depreciation in manufacturing was estimated using enterprise data.

Households-Factors: Compensation of employees

For the disaggregated factor income matrix, we rely on the VHLSS data survey (GSO 2003/9). The figure projected there from varies from the macro-SAM entry from employed and self-employed labour to rural and urban households (GDP at factor cost). Using these data, the urban households ended up 173230 short and rural households with 126352 too much according to row/column balance. To balance the SAM we shifted rural labour income to urban. The remaining deficit was balanced via the S-I account. Income from capital and land lease is summed up in the capital account accordingly.

Households-Enterprises: Distributed profits

No information was available. Distributed profits are therefore assumed to be included in the factor payments of enterprises to households.

Household- Government: Direct subsidies

Direct transfer payments from the state, namely pensions and other subsidies, are listed in the VHLSS and are straightforward to apply to the household group's survey.

Enterprises-Factors: Returns to capital

Operation surplus and consumption of fixed capital is available from the GSO (GSO 2003/5) for 20 sectors. Manufacturing, again had to be disaggregated relying on gross output shares. Income from the government was given an upward adjustment to balance the enterprise account.

State-Activities: Taxes

Government revenue in taxes is defined in GSO (GSO 2003/1, p. 37, GSO 2003/2, p. 10). Detailed information is available for the value-added tax across the 20 commodities, activity taxes across 26 activities and enterprise tax for state-owned and private enterprises. The direct tax share between the two household groups is derived from the Survey of VHLLS (GSO 2003/9). Other income includes subsidies from the central government (GSO 2003/1, p. 10), which is accounted for as transfers from ROV and from capital.

Government -ROW: Transfer payments

The income from ROV figure also includes annual payments of neighbouring Hoa Binh province. In practice it is compensation for the Hoa Binh hydroelectric power plant and its impacts on Son La province (GSO 2003/2, p.69).

Investment/Savings-Institutions: Savings Institutions

Income from savings is derived from the macro-SAM and adopted in order to balance the micro-SAM.

ROW/Commodities: Imports

Trade can be subdivided into trade with ROW and trade with ROV. Direct imports from ROW are documented in the Statistical Yearbook of Son La (GSO 2003, p. 165-167). The imports from ROV including indirect imports are calculated as residuals from the supply/demand balance. This assumption holds, if we assume that stocks do not change. For the use of import data for trade analysis see remarks under “*export*”.

Summing it up, the above disaggregation results in a 68x68 matrix, including 24 activities, 28 commodities, 3 factor accounts, 2 households incl. their home consumption, 3 enterprises, local and central governments, one savings-investment account and two transfer accounts (national and international). It is a consistent database that can be used for descriptive as well as quantitative analysis.

2.2 The Structure of the Provincial Economy

From the micro SAM perspective we can see that locally produced elements of provincial supply are restricted to primary products, manufacturing and services. Industrial products,

namely important intermediate inputs like chemicals (fertilizer, pesticides, medicine etc.), fuel and all kinds of machinery are not locally produced. Gross output and value added for 24 local sectors are summarised in table 2.

Table 2 Gross Output and Value Added (in Mio. VND)

	Gross Output	Value Added Labour employed	Value Added Labour employed	Value Added self-Capital
A01 Crops	1,203,327	13,554	912,623	68,512
A02 Livestock	278,958	2,076	130,596	6,708
A03 Forestry	332,000	10,642	260,451	3,754
A04 Fishery	44,519	1,032	29,096	1,414
A05 Mining	7,597	1,036	3,188	430
A06 Food&Beverage	106,179	11,313	11,172	5,813
A07 Textiles&Leather	16,468	0	2,287	1,107
A08Carpentry&ForestryProducts	16,942	1,085	1,933	2,516
A09 Publishing&Printing	9,139	1,650	0	1,080
A10 Construction Material	89,104	7,234	7,371	8,910
A11 Metal Products	16,963	42	4,417	1,369
A12 Electricity,Gas,Water	41,491	19,726	152	4,870
A13 Agricultural Service	9,637	2,106	0	268
A14 Construction	560,176	78,502	70,400	21,734
A15 Trade&Repair	208,763	15,605	117,122	12,467
A16 Restaurant&Hotel	89,155	2,711	29,663	3,380
A17 Transport	144,050	12,063	45,477	20,680
A18 Post&Communication	55,172	14,857	0	27,755
A19 Financial Service	42,850	11,473	0	18,674
A20 Science&Technology	4,686	2,635	0	0
A21 State Management	185,024	114,909	0	5,947
A22 Education	245,120	206,636	0	1,787
A23 Health	57,347	35,550	608	2,857
A24 Other Service	88,231	16,025	5,423	45,152

Source: Own table. Note. Complete 2002 micro SAM in annex

Agriculture and forestry constitute 49% of provincial output, followed by services (29%), construction (15%), and manufacturing with 7%. The relatively high share of services is dominated by the public service sector. Education, state management, border patrol and health contribute about 50% of service output, the share of marketable services is thus- as is characteristic of rural economies- low. Food processing and construction materials dominate the manufacturing sector with a combined share of 77%. Agriculture and forestry are by far the most important sectors, employing 87% of the total labour force and accounting for 57% of provincial GDP. The importance of the primary sector is likely to be underestimated because of the large component of subsistence produce or non-market share of primary output. It cannot be assumed that industrial production will pick up in this mountainous

province. However, growth potential exists in agriculture (Luibrand 2001), fish farming and the food processing industry. Regarding the massive infrastructure investments to the province associated with the hydroelectric power plant, it can be assumed that demand for goods and services will by far not be met by local supply.

Income from employed and self-employed labour in Son La province averaged about 4,81 Mio. VND (317 US\$) per year/worker. Rural households generated their income mostly from self-employed labour. 1,44 trillion VND stem from this type of income, whereas only 0,15 trillion VND stems from employed labour. On the contrary, urban households earned more from employed labour, namely 0,34 trillion VND from employed and 0,19 trillion from self-employed. The yearly income per urban dweller was 2.5 times higher than that of his or her rural counterpart.

Private consumption is concentrated in the primary sector; expenditure for other goods is mainly on textiles and food processing. Health and education constitute the highest shares in service expenditures. Urban total expenditure amounted to 0,47 trillion VND, rural expenditure to 1,11 trillion. That meant a more than three times higher value of urban expenditure per person compared to rural expenditure of 4,49 Mio. VND and 1,13 Mio. VND respectively. Especially in the health and education sector, expenditure between the household groups varied significantly. The ratio of private consumption and government consumption in the province is about 3:1, a relatively high share of government market participation. The nationwide average was about 22%. About 90% of the provincial government's budget stems from transfer payments from the central government.

Table 3 Expenditure Shares of Households as % of Total Household Consumption

	Urban Households	of which share home consumption	Rural Households	of which share home consumption
Food	47.9%	3.0%	65.4%	45.0%
Textiles	7.6%	0.6%	6.8%	0.3%
Carpentry, wood	10.6%	9.2%	5.7%	69.0%
Education	8.0%		1.8%	
Health	5.5%		3.6%	
Other	20.4%		16.7%	

Source: Own table. Note. Complete 2002 micro SAM in annex

Investment patterns are concentrated in the construction sector, a feature typical for agriculture- based rural economies. Investments will mushroom over the next decade with the planned dam construction. FDI shares are negligible and were limited to a mining company in Bac Yen and a tea export firm in Moc Chau. Exports of goods concentrate on the primary

sector. Agricultural products (including processed food) accounted for almost half of total exports to ROW. Major products are coffee beans, tea and sugar. The major export markets for these products were France and the Lao Republic. The manufacturing and light industry sector contributed the rest of the exports with textiles, handicraft, cement and other construction material as major products.

2.3 SAM Multiplier Matrix

External injections have the potential to boost the economy and lift mountainous people out of poverty, if these injections (e.g. investment) are seen as an integral part of the regional CPRGS strategy. Although it became clear from the SAM inspection that provincial production can not supply all the required goods, services and factors to the project, it can be assessed how each currency unit (CU) of increased final demand ripples through the provincial economy. As a first step we employ a simple multiplier model to estimate the impact of regional output increases of Son La economy. A "regional output multiplier", as used in this study, relates a change in the province's exogenously induced demand increase to the resulting total output change. However, SAM multipliers provide only first cut estimates of the effects of a policy or external shock and thus give some indication of the possible resultant effects of such an event on the factorial and institutional distributions of incomes as well as of the structure of output. It has become customary in input-output modelling to regard transactions in the government, the S-I and the ROW accounts to be exogenous. Mathematically, this split can be expressed as follows

$$z_i \equiv \sum_j x_{ij} + y_i \tag{1}$$

where $\sum_j x_{ij}$ sums sales by cells i over all cells j and y_i represents the sales of the exogenous accounts. In terms of technical conditions, we assume that the pattern of inputs identified in the base year is constant. This assumption allows us to define the production coefficients by dividing elements in each column of the respective column totals

$$a_{ij} = x_{ij} / q_j \tag{2}$$

where a_{ij} represents the production coefficients, x_{ij} the sales of cell i to cell j and q_j the total sales of column j . This yields a matrix of share parameters or the direct requirement matrix. The equilibrium condition means that demand equals supply:

$$q_j = z_j \tag{3}$$

One can then write:

$$q'_i \equiv \sum_j a_{ij} * q'_j + y'_i \tag{4}$$

Solving the system for q , where q represents the vector of q_i on the right side of the equation system above, A represents a matrix of the a_{ij} 's on the left side of the system, and y represents the column vector of y_i 's also on the left side of the above system:

$$q = A*q + y \tag{5}$$

The equation can be solved for q

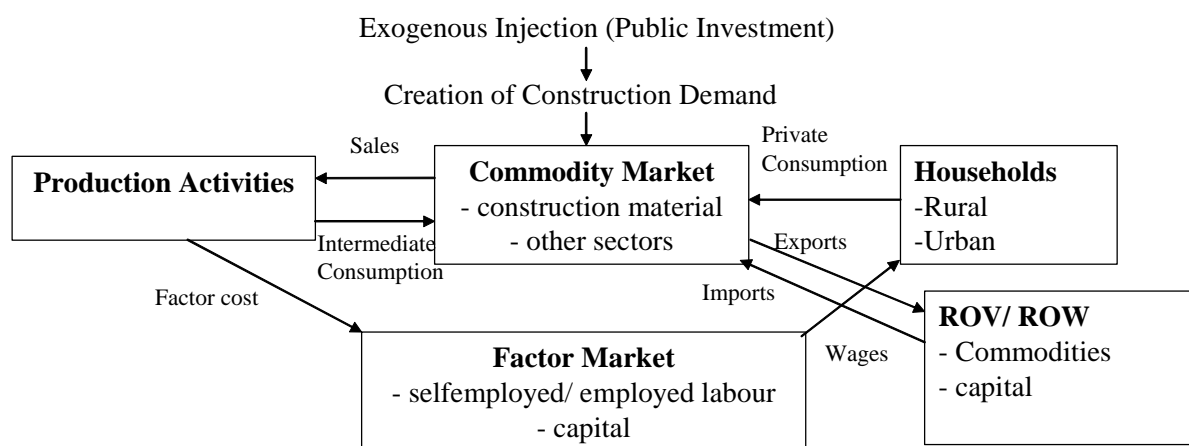
$$q = (I - A)^{-1}*y, \tag{6}$$

The term $(I - A)$ is called the “Leontief matrix”, $(I - A)^{-1}$ is called the “Leontief inverse”. The column sums of the Leontief inverse are sector multipliers specifying the total gross output of the economy directly and indirectly stimulated by a one currency unit (CU) change in final demand for each sector. Practically this is so because the production of any good requires ingredients from a combination of industries, factors and households. Thus the one CU increase in demand will stimulate the particular sector with one or more, the multiplier effects will produce indirect increases in other sectors depending on their linkages.

3. Development Perspectives for Son La Province

The Government of Vietnam has decided to finance Vietnam’s biggest dam in the northern mountainous province of Son La. The implementation of this project will have large-scale economic, social and environmental impacts on the region. The present study focuses mainly on the economic impacts. It can thus be regarded as one component of an approach that aims at assessing the whole complexity of issues concerning dam construction. Son La province was selected as the site of the dam and a hydroelectric power plant. The construction is planned to start in 2005. The power plant is scheduled to come on line between 2012 and 2015. It will have a capacity of up to 2.4 GW and will generate about 9.2 billion kWh/year. That equals the current volume of electric energy consumed annually in Northern Vietnam. Total investment, including road infrastructure is estimated to amount to 38 trillion VND (Vietnam News 2004) over a period from 2005- 2015. This construction process will influence the province in many ways. In the economic sphere of first round, there are two initial impacts of large-scale infrastructure developments. These are the supply-side and the demand-side effects could lead to poverty reduction and economic growth. In this paper, we concentrate on the demand-side effects of infrastructure construction. This is the channel through which jobs and income are generated by implementing the project itself. Graphically, the scenario can be presented as follows.

Figure 1 Output Multiplier Effects of the Construction Sector



Source: Own figure

Multiplier analysis allows for the quantification of these direct and indirect effects. The multiplier vectors show changes of output in each of the local sectors from a 1 CU change in final demand from the local construction sector. Results for the local construction sector are presented in table 4.

Table 4 Selected Output Multipliers of the Construction Sector

	Construction
Agriculture	0,30
Construction Material	0,24
Trade	0,09
Total Output	2,63
Labour employed	0,21
Labour self-employed	0,50
Total Value Added	0,81
Urban Households	0,20
Rural Households	0,50

Source: Own calculation. Complete multiplier table in annex 3

From this perspective, a one CU increase in construction demand is estimated to lead to a 0.3 CU increase in demand for agricultural products. Given the case that local agricultural production can meet the additional demand, rural farm households can profit significantly from these indirect effects. The demand for construction materials, including cement, bricks, gravel and sand is projected to increase by 0,24 per CU increase in demand for construction services. Trade service outputs are estimated to grow by 0,09 CU. This translates into a 0.71 CU increase in total labour income. Given that local construction service output increases by 20%, from the current 560.000 mio. VND to 672.000 mio. VND (GSO 2004), the provincial households could generate additional income of 78.400 mio. VND or about 470.000 VND per household. Compared to the average household income of 2,5 mio VND that would mean an

increase of 18%. However, urban households profit more under this scenario in absolute terms. Their annual income increases by 580.000 VND per household as compared to 280.000VND per household of their rural counterparts. These first results indicate that households could gain considerably from increased demand for construction services. However, this only holds if local factor and physical input resources are used.

4. Conclusion and Further Research

Social accounting matrixes and multiplier analyses can be regarded as macro models from their conceptual design. Their conclusions refer to a macro-economic context. However, it is of vital interest to regional and local development to assess impacts of policies or projects on the regional, local and household level. To meet these requirements, SAM-based models have to be further developed and interlinked. The present study aims at contributing to this process. The estimation process of the provincial SAM poses challenges as well as offering advantages compared to a nation or region-wide counterparts. Advantages can be seen in the relatively simple structure of the economy, the fact that major import goods are easily identifiable due to the lack of regional production as demand-supply ratios (machinery, fuel, fertilizer etc. in the case of Son La) and that export goods were largely limited to primary products. The small number of enterprises in key sectors allowed for the incorporation of enterprise data into the SAM. Inspection of the SAM confirms the fact that Son La province has all the typical features of a very poorly developed economy. Results from the multiplier model suggest that the large-scale infrastructure investment has great potential to contribute to economic growth in the region as was shown for the case of increased demand for local construction services. This reinforces the view that large-scale public investment projects should be embedded in regional CPRGS strategies, as they have the power to substantially contribute to socio-economic development. It becomes clear, however, that these projects contribute more to local economic growth the more local resources and factors they use. Furthermore, it must be added that due to the limited time period of investment flows, long-term strategies have to aim at sustainable follow-up initiatives in the province. In this context, the Government's development strategy for Son La province envisages ambitious goals for the period 2004 to 2010. These plans include the extension of the tea growing area from the current 3000 ha to 10000 ha, the coffee growing area from 4000 ha to 10000 ha and the mulberry growing area from 1000 ha to 3000 ha. Additionally the number of milking cows should increase from the current 2000 to 6000 by 2005 (Vietnam News 2002). The implementation of these plans will have macro-economic effects that have to be considered. It requires the interlinkage of the

regional SAM-based model with a national CGE model. This will be subject to further research.

The 2002 Son La SAM serves as a database to quantify the impacts of public investments on regional economic growth. However, the multiplier model has some shortcomings. General problems with multiplier analyses are the assumption of fixed prices, the absence of factor supply constraints and the static nature of the model. Furthermore, the analysis as conducted in the present study is restricted to supply-side effects. Confronting these shortcomings, further research aims at improving the present study in two directions: firstly, the multiplier model should be extended to a dynamic CGE model. Secondly, the scenarios have to be refined to make a useful contribution towards the use of the SAM based models to the set-up of PRSP and large-scale project planning.

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Annex 1

Son La SAM 2002	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 A01 Crops															
2 A02 Lifestock															
3 A03 Forestry															
4 A04 Fishery															
5 A 05 Mining															
6 A06Food Bev															
7 A07 TexGarLea															
8 A08 CarForPap															
9 A09PublishPrint															
10 A10 ConstrMat															
11 A11Metal Prod															
12 A12 ElGsWa															
13 A13 AgrServ															
14 A14 Constr															
15 A15 TradeRep															
16 A16 RestHot															
17 A17Trans															
18 A18 PostCom															
19 A19 FinanSer															
20 A20 ScieTech															
21 A21 StatMana															
22 A22 EducTrai															
23 A23 Health															
24 A24 OthServ															
25 C01 Crops	41959	19319	0	0	0	30415	674	0	2	0	0	2	0	0	0
26 C02 Lifestock	0	39716	0	0	0	1548	0	0	0	0	0	1	0	0	0
27 C03 Forestry	971	1022	17471	772	20	132	7	5634	7	109	2	15	0	932	207
28 C04 Fishery	0	401	0	4592	0	0	0	0	0	0	0	152	0	0	0
29 C05 Mining	0	41	116	16	412	1948	244	29	1	8801	85	264	0	9427	140
30 C06 Food Bev	181	33851	0	219	4	15403	7	7	6	21	3	44	0	548	318
31 C07 TexGarLea	0	101	291	85	6	64	6687	29	5	51	14	202	0	10468	179
32 C08 CarForPap	2988	15159	5591	438	66	1503	183	832	1564	1972	24	92	0	16607	816
33 C09 PublishPrint	207	473	349	28	3	95	5	12	1217	62	3	45	0	274	196
34 C10 Oth.Goods	0	568	495	408	80	3424	344	198	1769	1323	604	144	0	4111	207
35 C11 ConstrMat	1321	252	1252	276	669	234	942	168	46	20774	303	55	0	115371	581
36 C12 Metal Prod	1191	605	437	787	311	2639	669	152	80	748	6176	622	0	67359	436
37 C13 Chemicals	119519	3124	9988	856	192	2003	690	703	331	5466	112	143	0	51766	1229
38 C14 Machinery	2226	310	2912	1235	122	573	77	220	135	962	804	2605	0	56699	8435
39 C15 ElGsWa	106	2176	1751	25	85	2046	557	324	74	2980	787	1315	0	1365	1233
40 C16 Fuel	1004	17161	1948	1275	527	1880	237	574	23	7199	370	60	0	14394	1988
41 C17 AgrServ	28083	172	1022	201	0	0	0	0	0	0	0	39	4380	0	0
42 C18 Construction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43 C19 TradeRep	6474	2168	4993	526	191	9938	934	1103	727	10985	970	4984	1105	23939	3615
44 C20 RestHot	354	0	523	0	0	0	0	0	0	0	0	0	0	0	0
45 C21 Trans	132	11	2259	86	5	173	18	51	21	123	24	133	69	2839	1636
46 C22 PostCom	1497	445	3353	115	15	368	44	466	26	257	81	691	198	781	263
47 C23 FinanServ	0	59	262	188	11	188	38	69	35	310	34	522	439	1384	242
48 C24 ScieTech	0	25	24	568	12	49	36	53	3	53	71	244	357	426	5735
49 C25 StatMana	0	0	0	252	64	319	38	42	3	105	44	141	133	2200	26352
50 C26 Education	596	0	214	0	0	0	0	0	0	0	0	20	0	0	0
51 C27 Health	79	0	71	12	2	18	26	2	3	29	2	177	77	213	182
52 C28 OthServ	0	0	1118	15	2	74	21	3	1	29	2	141	68	284	141
53 Labour employed	13554	2076	10642	1032	1036	11313	0	1085	1650	7234	42	19726	2106	78502	15605
54 Labour selfempl.	912623	130596	260451	29096	3188	11172	2287	1933	0	7371	4417	152	0	70400	117122
55 Capital	68512	6708	3754	1414	430	5813	1107	2516	1080	8910	1369	4870	268	21734	12467
56 HHUrban															
57 HHRural															
58 HCUrb															
59 HCRur															
60 State Ent															
61 Private Ent															
62 FDI Ent															
63 VAT/ I-E Tax	0	1970	713	0	143	2849	597	738	331	3230	621	3888	438	8153	9441
64 DirTax,															
65 Government															
66 S-I															
67 ROV															
68 ROW															
TOTAL	1203578	278510	332000	44519	7597	106179	16468	16942	9139	89104	16963	41491	9637	560176	208763

Son La SAM 2002	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
A01 Crops										1203327						
A02 Lifestock											278958					
A03 Forestry												332000				
A04 Fishery													44519			
A 05 Mining														7597		
A06Food Bev															106179	
A07 TexGarLea																16468
A08 CarForPap																
A09PublishPrint																
A10 ConstrMat																
A11Metal Prod																
A12 ElGsWa																
A13 AgrServ																
A14 Constr																
A15 TradeRep																
A16 RestHot																
A17Trans																
A18 PostCom																
A19 FinanSer																
A20 ScieTech																
A21 StatMana																
A22 EducTrai																
A23 Health																
A24 OthServ																
C01 Crops	365	9	0	8	0	0	0	8	17							
C02 Lifestock	4512	19	0	0	0	0	0	27	0							
C03 Forestry	12	19	0	0	0	0	0	4	64							
C04 Fishery	2321	0	0	0	0	0	0	8	0							
C05 Mining	1261	133	11	8	0	16	2	15	415							
C06 Food Bev	20346	114	14	64	0	363	30	139	31							
C07 TexGarLea	1956	95	71	72	0	57	19	285	180							
C08 CarForPap	2344	350	363	319	6	891	311	162	703							
C09 PublishPrint	1155	57	63	1044	3	1559	362	216	520							
C10 Oth.Goods	825	227	352	558	3	870	303	351	232							
C11 ConstrMat	3428	142	201	24	1	647	80	69	990							
C12 Metal Prod	153	880	129	64	8	67	82	62	515							
C13 Chemicals	2191	2120	151	32	9	513	152	6073	435							
C14 Machinery	3841	2982	2265	80	23	3237	892	2728	1188							
C15 ElGsWa	858	665	600	309	31	1027	506	535	1224							
C16 Fuel	1741	43624	427	374	73	4782	392	654	1300							
C17 AgrServ	0	0	0	0	0	0	0	0	0							
C18 Construction	0	0	0	0	0	0	0	0	0							
C19 TradeRep	614	4198	815	535	217	5391	5291	3545	2385							
C20 RestHot	0	0	0	0	0	0	0	0	0							
C21 Trans	230	966	261	236	142	8897	4003	516	926							
C22 PostCom	80	533	44	101	35	859	1008	275	640							
C23 FinanServ	632	1533	482	1003	153	4794	3499	912	2914							
C24 ScieTech	268	233	5090	5488	11	10781	280	34	362							
C25 StatMana	641	2399	67	508	377	6106	1680	155	3232							
C26 Education	0	0	0	0	0	0	0	0	0							
C27 Health	24	167	83	155	13	8325	10946	361	424							
C28 OthServ	11	67	11	10	944	4985	6859	1187	565							
Labour employed	2711	12063	14857	11473	2635	114909	206636	35550	16025							
Labour selfempl.	29663	45477	0	0	0	0	0	608	5423							
Capital	3380	20680	27755	18674	0	5947	1787	2857	45152							
HHUrban																
HHRural																
HCUrb																
HCRur																
State Ent																
Private Ent																
FDI Ent																
VAT/ I-E Tax	3593	4298	1059	1711	0	0	0	11	2367							
DirTax, Government																
S-I																
ROV										38826		52535	24910	127845	167316	
ROW										375	17303	195	0	0	810	1440
TOTAL	89155	144050	55172	42850	4686	185024	245120	57347	88231	1203702	335087	332000	97054	32506	234834	185224

Son La SAM 2002	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
A01 Crops																
A02 Lifestock																
A03 Forestry																
A04 Fishery																
A 05 Mining																
A06Food Bev																
A07 TexGarLea																
A08 CarForPap	16942															
A09PublishPrint		9139														
A10 ConstrMat			89104													
A11Metal Prod				16963												
A12 ElGsWa							41491									
A13 AgrServ										9637						
A14 Constr											560176					
A15 TradeRep												208763				
A16 RestHot													89155			
A17Trans														144050		
A18 PostCom															55172	
A19 FinanSer																42850
A20 ScieTech																
A21 StatMana																
A22 EducTrai																
A23 Health																
A24 OthServ																
C01 Crops																
C02 Lifestock																
C03 Forestry																
C04 Fishery																
C05 Mining																
C06 Food Bev																
C07 TexGarLea																
C08 CarForPap																
C09 PublishPrint																
C10 Oth.Goods																
C11 ConstrMat																
C12 Metal Prod																
C13 Chemicals																
C14 Machinery																
C15 ElGsWa																
C16 Fuel																
C17 AgrServ																
C18 Construction																
C19 TradeRep																
C20 RestHot																
C21 Trans																
C22 PostCom																
C23 FinanServ																
C24 ScieTech																
C25 StatMana																
C26 Education																
C27 Health																
C28 OthServ																
Labour employed																
Labour selfempl.																
Capital																
HHUrban																
HHRural																
HCUrb																
HCRur																
State Ent																
Private Ent																
FDI Ent																
VAT/ I-E Tax																
DirTax,																
Government																
S-I																
ROV	184099	4313	17395	82516	75751	260154	180379	126884	107494	24261				25676		11102
ROW	1440			3623		300	6585									
TOTAL	202481	13452	17395	175242	92714	260454	186964	168375	107494	33898	560176	208763	89155	169726	55172	53952

Son La SAM 2002	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
A01 Crops																
A02 Lifestock																
A03 Forestry																
A04 Fishery																
A 05 Mining																
A06Food Bev																
A07 TexGarLea																
A08 CarForPap																
A09PublishPrint																
A10 ConstrMat																
A11Metal Prod																
A12 ElGsWa																
A13 AgrServ																
A14 Constr																
A15 TradeRep																
A16 RestHot																
A17Trans																
A18 PostCom																
A19 FinanSer																
A20 ScieTech	4686															
A21 StatMana		185024														
A22 EducTrai			245120													
A23 Health				57347												
A24 OthServ					88231											
C01 Crops									103426	302569	3363	448714				
C02 Lifestock									64638	171813	2564	20399				
C03 Forestry									2847	5449	566	8462				
C04 Fishery									14294	50470	312	23554				
C05 Mining									2861	1963	571	3517				
C06 Food Bev									40405	79473	561	988				
C07 TexGarLea									36234	114269	207	388				
C08 CarForPap									45996	29654	4682	65894				
C09 PublishPrint									693	3207	0	0				
C10 Oth.Goods									0	0	0	0				
C11 ConstrMat									755	3884	0	6				
C12 Metal Prod									1046	4235						
C13 Chemicals									8335	44224						
C14 Machinery									17200	75211						
C15 ElGsWa									7964	17754						
C16 Fuel									914	4572						
C17 AgrServ									0	0						
C18 Construction									0	0						
C19 TradeRep									26536	39662						
C20 RestHot									5389	6916						
C21 Trans									3692	6204						
C22 PostCom									1000	1516						
C23 FinanServ									219	4276						
C24 ScieTech									0	0						
C25 StatMana									0	0						
C26 Education									38351	29368						
C27 Health									26149	60346						
C28 OthServ									17080	49074						
Labour employed																
Labour selfempl.																
Capital																
HHUrban						338912	193220	43867								
HHRural						152876	1438759	27759								
HCUrb									12826							
HCRur										571922						
State Ent									57117							
Private Ent									10905							
FDI Ent									120							
VAT/ I-E Tax																
DirTax, Government									8233				146592	16097	120	
S-I									99672							46158
ROV	32287		158897	113443	44421	90694			27743	193548		69631				
ROW	0	0	0	0	0											
TOTAL	36973	185024	404017	170790	132652	582482	1631979	267183	680630	1678031	12826	571922	216223	16097	120	46158

Son La SAM 2002	64	65	66	67	68	TOTAL
A01 Crops						1203578
A02 Lifestock						278510
A03 Forestry						332000
A04 Fishery						44519
A 05 Mining						7597
A06Food Bev						106179
A07 TexGarLea						16468
A08 CarForPap						16942
A09PublishPrint						9139
A10 ConstrMat						89104
A11Metal Prod						16963
A12 ElGsWa						41491
A13 AgrServ						9637
A14 Constr						560176
A15 TradeRep						208763
A16 RestHot						89155
A17Trans						144050
A18 PostCom						55172
A19 FinanSer						42850
A20 ScieTech						4686
A21 StatMana						185024
A22 EducTrai						245120
A23 Health						57347
A24 OthServ						88231
C01 Crops		0	128961	116693	7200	1203702
C02 Lifestock		0	29850		0	335086
C03 Forestry	43253	34393	209436		195	332000
C04 Fishery		0	950		0	97054
C05 Mining		0	210		0	32506
C06 Food Bev		0	18628	11780	11285	234834
C07 TexGarLea		0	2889		10320	185224
C08 CarForPap		0	2972		0	202481
C09 PublishPrint		0	1603		0	13452
C10 Oth.Goods		0	0		0	17395
C11 ConstrMat		0	15632		7140	175242
C12 Metal Prod		0	2976		285	92714
C13 Chemicals		0	0		95	260454
C14 Machinery		0	0		0	186964
C15 ElGsWa		0	118775		3302	168375
C16 Fuel		0	0		0	107494
C17 AgrServ		0	0		0	33898
C18 Construction	91601	468575			0	560176
C19 TradeRep		0	28149	18773	0	208763
C20 RestHot		0	3321	72652	0	89155
C21 Trans	13519	122555			0	169726
C22 PostCom		0	0	40481	0	55172
C23 FinanServ	29253	500			0	53952
C24 ScieTech	6368	400			0	36973
C25 StatMana	86473	10400	43291		0	185024
C26 Education	269309	66158			0	404017
C27 Health	46140	16766			0	170790
C28 OthServ	39972	9989		0	0	132652
Labour employed					20	582482
Labour selfempl.						1631979
Capital						267184
HHUrban	104631					680630
HHRural	58636					1678030
HCUrb						12826
HCRur						571922
State Ent	159106					216223
Private Ent	5192					16097
FDI Ent						120
VAT/ I-E Tax					7	46158
DirTax,						171042
Government	171042			870716		1187588
S-I		234135		595117		1092431
ROV						1978940
ROW			7779			39849
TOTAL	171042	1187589	1092431	1978939	39849	

Annex 2

Macro SAM accounts are derived as follows:

- **Activities-Commodities: *Marketed production* (Mio. VND 3.852.700)**
The gross output figure as reported in GSO (2003/5, p.1) is used directly in the Macro SAM. Within the double-entry accounting system, this transaction corresponds to the total value of sales in the activity row at producer prices.
- **Commodities-Activities: *Intermediate consumption* (Mio. VND 1.342.028)**
Intermediate consumption for the province is taken straightforwardly from GSO (2003/5, p.1)
- **Commodities-Households: *Private consumption* (Mio. VND 1.937.499)**
The figure for private consumption is derived from the balance sheet of gross domestic product as documented in GSO (2003/1, p. 26). It comprises the GDP share of households and cooperatives. An upward adjustment of 0,1 billion VND has been made in order to balance the SAM. This adjustment is in line with results of the VHLSS (2002) for the province that suggests a private consumption figure of 2,18 billion VND.
- **Commodities-State: *State consumption* (Mio. VND 623.163)**
State consumption is reported in the GDP sheet (2003/1, p.26).
- **Commodities-Investment/Savings: *Investment* (Mio. VND 902.099)**
Capital formation is documented in GSO (2003/1, p. 131).
- **Commodities-ROW: *Exports* (Mio. VND 552.928)**
Regional export figures to ROW are available in GSO (2003/1, p. 162) amounting to VND 72.274. However, supply and demand ratios of the micro SAM suggest this figure to be Mio. 552.928 VND.
- **Factors-Activities: *Value added* (Mio. VND 2.466.332)**
Data to calculate the total value added for the province are documented in GSO (2003/5, p.1). It is calculated as the sum of the compensation of employees (labor income from salaries, premiums and mixed income), depreciation, operating surplus and production taxes.
- **Households-Factors: *Compensation of employees* (Mio. VND 2.114.667)**
Wages, salaries and other benefits are reported by GSO (2003/5, p.1), comprising mixed income and compensation of employees.
- **Households-Enterprises: *Distributed profits* (Mio. VND 106.256)**
Distributed profits are documented as “premiums” in value added in GSO 2003/5, p.1)
- **Household- Government: *Direct subsidies* (Mio. VND 9.579)**
Direct transfer payments (particularly pensions) are reported in the government expenditure balance in GSO (2003/1, p, 31). However, data from VHLSS suggests that this figure underestimates the real transfers to households. This issue will be further developed in the process micro SAM estimation.
- **Enterprises-Factors: *Returns to capital* (Mio. VND 210.692)**
Gross profits are calculated by adding the operating surplus and the payments for depreciation (consumption of fixed capital) as presented in GSO (2003/5, p.1).
- **Enterprises-State: *Enterprise subsidies* (Mio. VND 34.732)**
Subsidies for state enterprises are documented in GSO 2003/2, p. 74. No information is available for private enterprises.
- **State-Activities: *Value Added taxes* (Mio. VND 44.340)**
Are reported in (GSO 2003/1, p. 30)
- **Government-Commodities: *Trade taxes* (Mio. VND 108)**
Are reported as being 108 Mio VND (GSO 2003/1, p. 30)

- Government-Factors: *Factor taxes (Mio. VND 22.271)*
Includes land use tax, land transfer fees and other factor-related fees (GSO 2003/2, p.69)
- Government-Households: *Income taxes (Mio. VND 7.951)*
Personal income taxes are reported in the government revenue tableau (GSO 2003/1, p.30).
- Government-Enterprises: *Enterprise taxes (Mio. VND 69.537)*
Government revenue from enterprises includes income from direct enterprise taxes as well as income from state-owned enterprises (GSO 2003/1, p.30)
- Government -ROW: *Transfer payments (Mio. VND 1.070.633)*
By far the largest portion of regional government income stems from transfer payments from ROW (GSO 2003/1, p. 30).
- Investment/Savings-Institutions: *Savings Institutions (Mio. VND 902.099)*
Total household savings are documented by GSO (2003/2, p.62) as being 240.426 Mio. VND. Enterprise savings are adapted to 69.631 Mio. VND and central government savings are estimated at 547.366 Mio. VND in order to balance the SAM.
- ROW/Commodities: *Imports (Mio. VND 1.504.859)*
Direct imports to the province are documented in GSO (2003/1. p. 165).
Imports to the province are residually calculated as the difference of regional supply and demand of goods and services. This approach is supported by the fact that important commodities like chemicals, machinery and fuel are not produced in the province.
- ROW/Factors: *Payments to ROW (Mio. VND 118.702)*
Payments to ROW/ ROV include payments to centrally managed SOEs in the province (GSO 2003/5, p.1)

Annex 3

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1 Crops	1.83	0.62	0.85	0.34	0.13	0.38	0.03	0.14	0.15	0.00	0.00	0.10	0.00	0.30	0.67	0.51	0.35	0.31	0.14	0.31	0.56	0.97	0.19	0.49	1.04
2 Lifestock	0.24	1.30	0.25	0.10	0.04	0.08	0.01	0.04	0.05	0.00	0.00	0.03	0.00	0.09	0.20	0.20	0.11	0.11	0.05	0.11	0.20	0.29	0.07	0.21	0.30
3 Forestry	0.02	0.02	1.08	0.02	0.00	0.01	0.00	0.06	0.01	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.01	0.01	0.00	0.01	0.01	0.02	0.00	0.01	0.02
4 Fishery	0.08	0.05	0.08	1.08	0.01	0.02	0.00	0.01	0.01	0.00	0.00	0.01	0.00	0.03	0.07	0.07	0.04	0.03	0.01	0.03	0.06	0.10	0.02	0.05	0.10
5 Mining	0.01	0.01	0.01	0.00	1.02	0.01	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.03	0.01	0.02	0.01	0.00	0.00	0.01	0.01	0.01	0.00	0.01	0.01
6 Food&Beverage	0.13	0.21	0.14	0.06	0.02	1.11	0.00	0.02	0.03	0.00	0.00	0.02	0.00	0.05	0.11	0.33	0.06	0.07	0.03	0.07	0.12	0.15	0.04	0.13	0.16
7 TexGarLeath	0.13	0.09	0.14	0.05	0.02	0.04	1.04	0.02	0.03	0.00	0.00	0.02	0.00	0.07	0.11	0.10	0.06	0.06	0.03	0.06	0.11	0.15	0.03	0.11	0.16
8 Other Goods	0.03	0.09	0.06	0.03	0.02	0.05	0.01	1.12	0.04	0.00	0.00	0.01	0.00	0.20	0.04	0.09	0.02	0.02	0.01	0.04	0.02	0.03	0.01	0.03	0.04
9 Construction Mat	0.01	0.01	0.01	0.01	0.03	0.00	0.01	0.01	1.14	0.00	0.00	0.00	0.00	0.24	0.01	0.05	0.01	0.00	0.00	0.01	0.01	0.01	0.00	0.01	0.01
10 Chemicals	0.24	0.11	0.17	0.07	0.03	0.06	0.01	0.04	0.06	1.00	0.00	0.02	0.00	0.15	0.12	0.11	0.07	0.06	0.06	0.06	0.10	0.16	0.03	0.09	0.17
11 Machinery	0.09	0.06	0.10	0.05	0.02	0.03	0.00	0.03	0.03	0.00	1.00	0.03	0.00	0.14	0.12	0.10	0.06	0.04	0.03	0.06	0.07	0.11	0.02	0.07	0.11
12 ElGasWa	0.03	0.03	0.03	0.01	0.01	0.02	0.00	0.02	0.03	0.00	0.00	1.01	0.00	0.02	0.03	0.03	0.02	0.01	0.01	0.02	0.02	0.03	0.01	0.03	0.03
13 Fuel	0.03	0.08	0.04	0.03	0.02	0.02	0.00	0.02	0.05	0.00	0.00	0.01	1.00	0.05	0.04	0.05	0.27	0.02	0.01	0.04	0.02	0.03	0.01	0.02	0.03
14 Construction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15 TradeRep	0.08	0.06	0.09	0.04	0.02	0.07	0.01	0.04	0.09	0.00	0.00	0.04	0.00	0.09	1.08	0.07	0.06	0.05	0.04	0.07	0.07	0.08	0.02	0.08	0.08
16 RestHot	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	1.01	0.00	0.01	0.00	0.01	0.01	0.01	0.00	0.01	0.01
17 Transport	0.01	0.01	0.02	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.01	1.01	0.02	0.01	0.03	0.01	0.01	0.00	0.01	0.01
18 Education	0.05	0.03	0.05	0.02	0.01	0.02	0.00	0.01	0.01	0.00	0.00	0.01	0.00	0.02	0.04	0.03	0.02	1.03	0.01	0.03	0.06	0.05	0.02	0.08	0.05
19 Health	0.07	0.05	0.08	0.03	0.01	0.02	0.00	0.01	0.01	0.00	0.00	0.01	0.00	0.03	0.07	0.04	0.03	0.06	1.02	0.06	0.06	0.09	0.02	0.07	0.09
20 OthService	0.14	0.08	0.14	0.06	0.02	0.05	0.01	0.04	0.04	0.00	0.00	0.03	0.00	0.07	0.28	0.09	0.09	0.09	0.04	1.19	0.09	0.13	0.03	0.09	0.14
Gross Output	3.20	2.90	3.36	2.00	1.44	2.01	1.14	1.64	1.83	1.00	1.00	1.37	1.00	2.63	3.03	2.92	2.30	2.01	1.53	2.20	1.61	2.45	0.53	1.60	2.57
21 Lab. Empl.	0.13	0.09	0.16	0.06	0.05	0.10	0.01	0.06	0.09	0.00	0.00	0.14	0.00	0.21	0.23	0.12	0.14	0.59	0.24	0.46	1.10	0.13	0.03	0.11	0.13
22 Lab. Selfempl.	1.58	1.06	1.69	0.66	0.24	0.43	0.04	0.26	0.25	0.00	0.00	0.12	0.00	0.50	1.25	0.90	0.64	0.34	0.17	0.37	0.58	1.97	0.20	0.54	1.02
23 Capital	0.15	0.10	0.11	0.06	0.03	0.07	0.01	0.07	0.09	0.00	0.00	0.05	0.00	0.10	0.18	0.11	0.17	0.05	0.04	0.29	0.07	0.11	1.02	0.07	0.11
Value Added	1.86	1.25	1.96	0.78	0.32	0.60	0.06	0.38	0.42	0.00	0.00	0.31	0.00	0.81	1.66	1.14	0.95	0.98	0.45	1.11	1.75	2.20	1.25	0.73	1.26
24 HHUrban	0.29	0.20	0.31	0.12	0.06	0.12	0.01	0.07	0.09	0.00	0.00	0.11	0.00	0.20	0.31	0.20	0.18	0.39	0.17	0.36	0.72	0.32	0.21	1.14	0.21
25 HHRural	1.44	0.97	1.54	0.61	0.23	0.42	0.04	0.25	0.25	0.00	0.00	0.15	0.00	0.50	1.18	0.84	0.62	0.46	0.22	0.47	0.81	1.78	0.29	0.52	1.95
Household Income	1.73	1.17	1.85	0.73	0.29	0.54	0.05	0.33	0.34	0.00	0.00	0.26	0.00	0.71	1.49	1.04	0.80	0.85	0.38	0.83	1.53	2.10	0.50	1.66	2.16

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