# A Social Accounting Matrix for Nepal for 2007: Methodology and Results

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## Introduction and Background

A Social Accounting Matrix (SAM) is a generalization of the production relations and extends this information beyond the structure of production to include: (a) the distribution of value added to institutions generated by production activities; (b) formation of household and institutional income; (c) the pattern of consumption, savings and investment; (d) government revenue collection and associated expenditures and transactions; and (e) the role of the foreign sector in the formation of additional incomes for household and institutions. In particular, the accounting matrix of a SAM identifies the economic relations through six accounts: (1) total domestic supply of commodities; (2) activity accounts for producing sectors; (3) main factors of production (e.g. labour and capital); (4) current account transaction between main institutional agents such as households and unincorporated capital, corporate enterprises, government and the rest of the world and the use of income by the representative households; (5) the rest of the world; and (6) one consolidated capital account (domestic and rest of the world) to capture the flows of savings and investment by institutions and the rest of the world respectively.

Social accounting matrices can serve two basic purposes: (i) as a comprehensive and consistent data system for descriptive analysis of the structure of the economy and (ii) as a basis for macroeconomic modeling. As a data framework, a SAM is a snapshot of a country at a point in time (Pyatt and Thorbecke, 1976). To provide as comprehensive a picture of the structure of the economy as possible, a particular novelty of the SAM approach has been to bring together macroeconomic data (such as national accounts) and microeconomic data (such as household surveys), within a consistent framework. The second purpose of a SAM is the provision of a macroeconomic data framework for policy modeling. The framework of a SAM can often help in establishing the sequence of interactions between agents and accounts which are being modelled. A SAM provides an excellent framework for exploring both macroeconomic and multi-sectoral issues and is useful starting point for more complex models (Robinson, 1989).

The prime of objective of this study is to produce a SAM for Nepal for 2007 using existing 2007 SAM prepared for Nepal as part of the GTAP data base, supplemented with available official information on production, consumption and macro-economic aggregates and the Household Income and Expenditure. In addition to capturing the structure of Nepalese economy for 2007, the SAM 2007 is served as a consistent data base for the GTAP modelling system to assess the welfare implication of global trade shocks on Nepal. The key features of the new SAM 2007 are discussed below.

The paper is organized in five sections. Section 2 provides a detailed description of the SAM structure and the methodology adopted to update/construct the SAM 2007. Major adjustments that were invoked to reconcile conflicting data sources are also highlighted in this section. Derivation of the factor account estimates is presented in section 3. Estimates of data sets for institutions, including household, are discussed in section 4. An analysis of SAM results is presented the final section.

## Nepal SAM 2007

The 2007 SAM identifies the economic relations through *four types of accounts*: (i) production activity and commodity accounts for 114 sectors; (ii) 3 factors of production involving labour, capital and land; (iii) current account transaction between 3 main institutional agents; household-members and unincorporated capital, government and the rest of the world; and (iv) a consolidated capital account to capture the flows of savings and investment. The disaggregation of activities, commodities, factors and institutions in SAM 2007 is given in Table 1.

**Table 1: Disaggregation and Description of Nepal SAM Accounts**

| Set | Description of Elements |
|---|---|
| **Activities (57)** | |
| Agriculture (14) | Paddy, Wheat, Other Grain, Vegetables & Fruits, Oilseed, Sugar-cane, Jute and Other Plant Fibers, Other Crops, Cattle, Other Animal Product, Raw Milk, Wool, Forestry, and Fishing |
| Mining (4) | Coal, Oil, Gas and Other Mining |
| Manufacturing (24) | Meat, Meat Product, Vegetable Oil, Dairy Product, Other Grain Mill, Sugar, Other Food Product, Beverage-Tobacco, Textile, Wearing Apparel, Leather Product, Lumber, Paper & Paper Product, Petroleum, Chemical and Rubber, Mineral Product, Iron & Steel, Non-Ferrous Metal, Fabricated Metal, Motor-Vehicle, Other Transport Equipment, Electronic Equipment, Other Mech. & Equipment, Other Manufacturing. |
| Utility (3) | Electricity, Gas and Water |
| Services (12) | Construct, Trade, Other Transport, Water Transport, Air Transport, Communication, Financial Intermediaries, Insurance, Other Business Services, Recreation and Other Services, Government Services and Dwelling |
| **Commodities (57)** | |
| Agriculture (14) | Paddy, Wheat, Other Grain, Vegetables & Fruits, Oilseed, Sugar-cane, Jute and Other Plant Fibers, Other Crops, Cattle, Other Animal Product, Raw Milk, Wool, Forestry, and Fishing |
| Mining (4) | Coal, Oil, Gas and Other Mining |
| Manufacturing (24) | Meat, Meat Product, Vegetable Oil, Dairy Product, Other Grain Mill, Sugar, Other Food Product, Beverage-Tobacco, Textile, Wearing Apparel, Leather Product, Lumber, Paper & Paper Product, Petroleum, Chemical and Rubber, Mineral Product, Iron & Steel, Non-Ferrous Metal, Fabricated Metal, Motor-Vehicle, Other Transport Equipment, Electronic Equipment, Other Mech. & Equipment, Other Manufacturing. |
| Utility (3) | Electricity, Gas and Water |
| Services (12) | Construct, Trade, Other Transport, Water Transport, Air Transport, Communication, Financial Intermediaries, Insurance, Other Business Services, Recreation and Other Services, Government Services and Dwelling |
| **Factors of Production (3)** | |
| Labour (1) | Labour |
| Capital (2) | Capital and Land |
| **Current Institutions (11)** | |
| Households (7) | Rural: landless, Agricultural marginal farmer, Agricultural small farmer, Agricultural large farmer<br>Urban: Households with low educated heads, Households with medium educated heads and households with high educated heads |
| Others (2) | Government, and Rest of the World |
| **Capital Institutions (1)** | |

The year 2007 was chosen as the base year to construct the Nepal SAM as most of data of the key components of activity-commodity and institutional accounts are available for the year 2007. Moreover, the newly updated/constructed input-output table prepared for GTAP is also available for 2007 reflecting the consistent activity-commodity accounts for 2007. The consistent activity-commodity accounts then formed the base on which the factors and institutional accounts were disaggregated to derive the Nepal SAM 2007.

The construction of 2007 SAM is based on several data sets drawn from diverse sources. They are listed below.

1. The Input-output table 2007 for Nepal; Prepared as part of the GTAP modelling system.
2. The Input-output table 2000 for Nepal prepared by Institute for Policy Research and Development (IPRAD)[2].
3. Central Bureau of Statistics (2003), Nepal Living Standard Survey II, 2002/03 conducted by Central Bureau of Statistics.
4. Ministry of Finance (2008), Economic Survey of Nepal.
5. Revenue Data from Inland Revenue Board.
6. Statistical Yearbook prepared by Central Bureau of Statistics.
7. Nepal Labour Force Survey 2008, Central Bureau of Statistics.

The construction procedure proceeded in two steps. In the first step, a 'proto-SAM' was constructed using the data collected from diverse sources. Since the data came from different sources as well as for different years, in line with the expectation, the estimated 'proto-SAM' was unbalanced. In the second step, the SAM was balanced by adjusting the activity and commodity (i.e. private consumption, intermediate demand vectors) accounts as explained below.

Constructing a SAM is not only an exercise in putting together a complete data set, but also an estimation process on the basis of insufficient and partly inconsistent data. In this current exercise, the first step to generate a consistent and balanced SAM is to build a macroeconomic SAM (i.e. the Macro SAM). The main objective of the Macro SAM is to summarize and to show the circular flow in the economy in general and inter-dependence between commodity, activity, consumption, and flow-of-funds without sectoral or institutional detail. Thus, in the second step a preliminary disaggregated SAM (i.e. also referred to as the Micro SAM) is constructed using available disaggregated information drawn from various data producing agencies. Subject to data availability, the disaggregated SAM segregates most of the Macro SAM accounts to the desired sectoral and institutional breakdowns. While ensuring balance between the receipts and outlays for all accounts, the disaggregated or micro SAM must reproduce the control totals of the macro SAM. The correspondence between accounts of the aggregated micro SAM and macro SAM thus ensure its desired consistency with the national account data.

[2] Under this initiative a GTAP Compatible Input Output (I/O) Table and Social Accounting Matrix (SAM) was prepared. More specifically, a 57*57 Input/Output Table and an Aggregative SAM Prepared were prepared for Nepal.

## Overview of the Nepal SAM for 2007

The Nepal macro SAM is "anchored" primarily to the 'Input-output table 2007', 'National Accounts' data and other macro aggregates. The complete Macro SAM for 2007 containing the national accounts and other data including transfers, taxes and foreign transactions is shown in Table 2. Savings of households have been adjusted to fulfil the macroeconomic balance of the SAM. Government savings are computed as the difference between total government receipts and total government spending.

**Table 2: Nepal Macro SAM 2007**

(Billion Rupees)

| SAM Accounts | SNA Accounts | Code | | ACT | COM | Factors | | | | | Domestic Institutions | | Capital | RoW | Total Income |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1 | 2 | 3 | | | | | 4 | | 5 | 6 | |
| | | | | | | Labour | Capital | Land | Indirect Tax | Import duty | Household | Government | Investment | | |
| **Activity A/C** | Activities | **1** | | | 1192.4 | | | | | | | | | | 1192.4 |
| **Production A/C** | Commodities | **2** | | 406 | | | | | | | 647.4 | 46.2 | 196.4 | 93.6 | 1389.3 |
| **Distribution of Primary Income** | Income Generation by Institutions | **3** | Compensation To Employees | 287 | | | | | | | | | | | 287.0 |
| | | | Operating Surplus | 317 | | | | | | | | | | | 317.0 |
| | | | Land Return | 72 | | | | | | | | | | | 72.3 |
| | | | Indirect Tax | 18.1 | 52.3 | | | | | | | | | | 70.4 |
| | | | Import Duty | 3.1 | 10.6 | | | | | | | | | | 13.7 |
| **Use of Income** | Primary Income of Institutions | **4** | Household | | | 287 | 317 | 72.3 | | | | 8.0 | | 92.6 | 776.1 |
| | | | Government | | | | | | 70.4 | 13.7 | 16.0 | | | | 100.1 |
| **Consolidated Capital AC** | Capital Account | **5** | Capital | | | | | | | | 112.8 | | | | 196.4 |
| **Rest of World** | Rest of the World-Imports (current) | **6** | Imports | 90.0 | 134.0 | | | | | | | 45.9 | | 37.8 | 224.0 |
| **Total Expenditure A/C** | | | | 1192.4 | 1389.3 | 287.0 | 317.0 | 72.3 | 70.4 | 13.7 | 776.1 | 100.1 | 196.4 | 224.0 | |

Note: Based on the SNA-SAM Relationship

## Production Accounts

Production accounts composed of activities and commodities. Activity and commodity accounts of a SAM deal with the supply and demand components of the economy. Derivation of activity-commodity accounts thus imply generation of each element of supply and demand by the representative activity-commodity classification. In the current exercise it envisages derivation of supply and demand components by 57 representative activities and commodities.

Value Added: According to the 'National Accounts' of Nepal, estimates of value added are provided for 15 broad sectors (this is referred to as 'NA 15 sector'). Value added data by 15 sectors are available for 2007 which is the base for the value added update. These value added information are used to derive the value added by 57 SAM activities. The generation of value added by 57 SAM activities from the NA 15 sector information is discussed below.

In the **first** step a mapping is defined to establish a correspondence between the NA 15 sectors and SAM 57 activities. Classification of value added sectors according to these groups is shown in the Table 3.

**Table 3: Classification of SAM Value added Sectors by Groups**

| NA 15 Sector | SAM 57 Activity |
|---|---|
| Agriculture-Forestry and Fishing (2) | Paddy, Wheat, Other Grain, Vegetables & Fruits, Oilseed, Sugar-cane, Jute and Other Plant Fibers, Other Crops, Cattle, Other Animal Product, Raw Milk, Wool, Forestry, and Fishing **(1..14)** |
| Mining and Quarrying (1) | Coal, Oil, Gas and Other Mining **(15..18)** |
| Manufacturing (1) | Meat, Meat Product, Vegetable Oil, Dairy Product, Other Grain Mill, Sugar, Other Food Product, Beverage-Tobacco, Textile, Wearing Apparel, Leather Product, Lumber, Paper & Paper Product, Petroleum, Chemical and Rubber, Mineral Product, Iron & Steel, Non-Ferrous Metal, Fabricated Metal, Motor-Vehicle, Other Transport Equipment, Electronic Equipment, Other Mech. & Equipment, Other Manufacturing **(19..42)** |
| Electricity, Gas and Water Supply (1) | Electricity, Gas, Water supply **(43..45)** |
| Construction (1) | Construction **(46)** |
| Wholesale and Retail Trade (1) | Trade **(47)** |
| Transport, Storage and Communication (1) | Air Transport, Water Transport, Land Transport, Other Transport, Communication **(48..51)** |
| Financial Intermediation (1) | Financial Intermediation and Insurance **(52..53)** |
| Real estate, renting and business activities (1) | Other Business Services **(54)** |
| Hotels and restaurants; Public administration and defence; Education, Health and Social Work; Other community, social and personal service activities (5) | Recreation and Other Services, Government Services, Dwelling **(55..57)** |
| Set Definition: j=1..15 | K= 1…57; a=1…14; b=15..18; c=19..42; d=43..45; e=46; f=47; g=48..51; m=52..53; x=54; z=55..57; |

In the **second** step, value added for SAM 57 activities is derived using the value added information of the NA 15 sectors. For example, value added for agriculture sub-sector for 2007 ( ${}_{NA}VA_j^{07}$ ) by National Account classification is mapped to 14 SAM agriculture activities to generate value added for 2007 for these 14 sectors ( $VA_a^{07}$ ). This procedure is applied to derived 2007 value added for the remaining 43 SAM activities using the value added of the remaining 14 NA sectors. Adding of the

derived value added using the above procedures generates the value added for the 57 SAM activities for 2007.

$$VA_K^{07} = VA_a^{07} + VA_b^{07} + VA_c^{07} + VA_d^{07} + VA_e^{07} + VA_f^{07} + VA_g^{07} + VA_m^{07} + VA_x^{07} + VA_z^{07} \quad (1)$$

Outputs or Domestic Supply: As mentioned above, along with value added data the NA also provided gross output data by the activities included in the above 15 broad NA sector classification. Similar mapping schemes were used to generate gross output vectors for the 57 activities ( $Q_K^{07}$ ) for 2007.

Indirect Tax: Information of indirect tax mobilized from the domestic bases for 2007 ( ${}_{IRB}IT_W^{07}$ ) by selected commodity (i.e. referred to as w) is obtained from the 'Inland Revenue Broad (IRB)'. The sector classification used by IRB is different from the 57 SAM activity classifications. Hence a mapping scheme relating the IRB classification to SAM activity classification is defined. Thus using both the NTA information and mapping scheme the indirect tax vector for 2007 ( $IT_K^{07}$ ) was derived.

Intermediate Input Use: Inter-industry transaction matrix for 2007 is not available from which input use for the SAM 57 activities can be obtained. Value added vector derived for the 57 activities are deducted from the gross output vector for the 57 activities to derive the intermediate input use by 57 SAM activities for 2007.

$$IU_K^{07} = Q_K^{07} - IT_K^{07} - VA_K^{07} \quad (2)$$

Imports of Goods and Services: Information of imports of goods and services for 2007 year ( ${}_{UN\_COMTRADE}M_m^{07}$ ) is obtained from Import of Commodities by 6-digit level, collated by Detail Export-Import figure (HS 6 Digit) produced by the UN-COMTRADE (*http://comtrade.un.org*) database. The sector classification (i.e. denoted as m) used by UN-COMTRADE varies from the 57 SAM activity classifications (i.e. k). Hence a mapping scheme linking the UN-COMTRADE classification to SAM classification is used to derive imports by 57 SAM sectors for 2007.

$$M_K^{07} = {}_{UN\_COMTRADE}M_m^{07} \quad (3)$$

Revenue from import bases for 2007 fiscal year ( ${}_{IRB}dM_W^{07}$ ) is obtained from the Inland Revenue Board (IRB). The goods sector classification used by IRB is different from the 57 SAM import classifications. Hence a mapping scheme relating the IRB classification to SAM commodity classification is used to derive import duty by 57 commodity-imports for 2007.

$$dM_K^{07} = {}_{NBR}dM_W^{07} \quad (4)$$

Total Supply: Main components of the supply side of an economy are domestically produced goods and services or outputs ( $Q_K^{07}$ ) and imports of goods and services ( $M_K^{07}$ ). Total supply of goods and services ( $SS_K^{07}$ ) for 2007 by 57 SAM activities are generated by adding outputs to imports. Total supply is given as:

$$SS_K^{07} = Q_K^{07} + M_K^{07} + dM_K^{07} \quad (5)$$

The estimates of supply and its components by 57 commodities are reported in table below.

**Table 4: Supply and its components**

(Million Rupees)

| Commodity | TS07 | Gross Output | Value Added | Input | Imports* | Imports Cif | Duty |
|---|---|---|---|---|---|---|---|
| Paddy Cultivation | 47172 | 45704 | 38569 | 7135 | 1468 | 1402 | 66 |
| Wheat Cultivation | 14201 | 13644 | 11274 | 2370 | 557 | 554 | 3 |
| Other Grain Cultivation | 22250 | 21551 | 18912 | 2640 | 699 | 672 | 27 |
| Vegetable and Fruit Cultivation | 60720 | 43043 | 38210 | 4834 | 17677 | 16630 | 1047 |
| Oilseed Cultivation | 5545 | 5004 | 4390 | 613 | 541 | 507 | 34 |
| Sugarcane Cultivation | 3603 | 3323 | 2832 | 492 | 280 | 279 | 1 |
| Jute and Other Plant Fibres Cultivation | 3038 | 3029 | 2645 | 384 | 9 | 8 | 1 |
| Other Crop Cultivation | 52476 | 47529 | 41517 | 6012 | 4947 | 4623 | 324 |
| Cattle Rearing | 13283 | 12135 | 7464 | 4672 | 1148 | 1079 | 69 |
| Other Animal Product | 21724 | 20777 | 14014 | 6763 | 947 | 881 | 67 |
| Raw Milk | 52167 | 49694 | 29703 | 19991 | 2474 | 2458 | 16 |
| Wool | 1032 | 262 | 203 | 59 | 771 | 748 | 23 |
| Forestry | 9598 | 9457 | 8421 | 1036 | 141 | 133 | 8 |
| Fishing | 6177 | 6177 | 3186 | 2991 | 0 | 0 | 0 |
| Coal Mining | 150 | 74 | 50 | 24 | 75 | 70 | 5 |
| Oil Mining | 400 | 255 | 221 | 34 | 145 | 135 | 10 |
| Gas Mining | 505 | 345 | 317 | 28 | 160 | 149 | 11 |
| Other Mining | 6520 | 3832 | 3478 | 354 | 2688 | 2511 | 177 |
| Meat | 2529 | 2481 | 527 | 1954 | 48 | 48 | 0 |
| Meat Product | 1599 | 1554 | 617 | 937 | 45 | 45 | 0 |
| Vegetable Oil Industry | 26040 | 12634 | 4138 | 8496 | 13406 | 12958 | 448 |
| Dairy Product | 13464 | 10308 | 3969 | 6339 | 3156 | 2903 | 254 |
| Other Grain Milling | 27578 | 24222 | 8639 | 15583 | 3356 | 3104 | 252 |
| Sugar Industry | 3284 | 3144 | 1417 | 1727 | 140 | 136 | 4 |
| Other Food Product | 22423 | 11918 | 6122 | 5796 | 10505 | 9765 | 740 |
| Beverage-Tobacco Product | 15343 | 9984 | 6024 | 3960 | 5359 | 4887 | 472 |
| Textile | 16701 | 8482 | 3223 | 5259 | 8219 | 7708 | 512 |
| Wearing Apparel | 18247 | 12957 | 6360 | 6597 | 5290 | 4854 | 436 |
| Leather Product | 20220 | 16915 | 2174 | 14741 | 3306 | 3117 | 188 |
| Lumber | 6517 | 5368 | 643 | 4725 | 1149 | 1066 | 82 |
| Paper & Paper Product | 19934 | 18327 | 4318 | 14009 | 1607 | 1546 | 61 |
| Petroleum | 36908 | 152 | 132 | 20 | 36756 | 33548 | 3208 |
| Chemical and Rubber | 19987 | 6622 | 4469 | 2153 | 13365 | 12951 | 414 |
| Mineral Product | 8460 | 4143 | 2284 | 1859 | 4317 | 4183 | 134 |
| Iron & Steel | 11268 | 4688 | 968 | 3720 | 6580 | 6286 | 294 |
| Non-Ferrous Metal | 18416 | 18182 | 8435 | 9747 | 234 | 210 | 25 |
| Fabricated Metal | 16503 | 15839 | 10347 | 5492 | 663 | 610 | 54 |
| Motor-Vehicle | 5921 | 2040 | 830 | 1210 | 3881 | 3509 | 372 |
| Other Transport Equipment | 3577 | 839 | 350 | 489 | 2738 | 2545 | 193 |
| Electronic Equipment | 8601 | 1176 | 273 | 903 | 7425 | 7133 | 292 |
| Other Machinery and Equipment | 10109 | 1109 | 591 | 518 | 9000 | 8551 | 449 |
| Other Manufacturing | 6250 | 3337 | 1372 | 1965 | 2913 | 2692 | 221 |
| Electricity Generation | 26673 | 22780 | 13925 | 8855 | 3893 | 3734 | 159 |
| Gas Extraction and Distribution | 1711 | 1472 | 740 | 732 | 240 | 221 | 19 |
| Water Generation | 2684 | 2531 | 1815 | 717 | 153 | 144 | 9 |
| Construction | 140353 | 125964 | 48536 | 77428 | 14389 | 13780 | 609 |
| Trade | 97669 | 95170 | 88286 | 6884 | 2498 | 2312 | 186 |
| Other Transport | 73828 | 63064 | 56639 | 6425 | 10763 | 10039 | 724 |
| Water Transport | 3254 | 2290 | 1926 | 364 | 964 | 921 | 43 |
| Air Transport | 14832 | 11127 | 7551 | 3575 | 3705 | 3415 | 290 |
| Communication | 43396 | 41888 | 15094 | 26795 | 1508 | 1483 | 25 |
| Financial Intermediaries | 9827 | 6394 | 2006 | 4389 | 3433 | 3431 | 1 |
| Insurance | 32667 | 28990 | 25090 | 3899 | 3678 | 3677 | 0 |
| Other Business Services | 58200 | 57328 | 33739 | 23590 | 871 | 843 | 28 |
| Recreation and Other Services | 80643 | 75717 | 38808 | 36909 | 4926 | 4609 | 317 |
| Government Services | 86349 | 79225 | 58469 | 20756 | 7124 | 6870 | 254 |
| Dwelling | 56779 | 55475 | 49668 | 5807 | 1304 | 1304 | 0 |
| **Total** | **1389308** | **1151673** | **745923** | **405750** | **237636** | **223977** | **13658** |
| **Share (%)** | **100.0** | **82.9** | **53.7** | **29.2** | **17.1** | **16.1** | **1.0** |

Note: * refers to total imports including intermediate imports.

Private or Household Consumption: Vector of private or household consumption has been obtained from the information of 'final consumption expenditure by basic heading of 154 commodities at current price', contained in Nepal Livings Standard Survey II (NLSS-II) produced by Central Bureau of Statistics (CBS) in 2003. Commodity classification of CBS is different than the SAM commodity classification. Hence in the *first step*, BBS consumption estimates by 140 commodities ( ${}_{NA}pC_K^{07}$ ) are mapped to 57 SAM commodities classification ( $pC_K^{07}$ ). Derivation of private consumption vector for 2007 is shown below.

$$pC_K^{07} = {}_{NA}pC_K^{07} \quad (6)$$

Government Consumption: Government consumption usually confines to sectors such as 'public administration' and 'education' and 'health'. The rationale is that different purchases (e.g. agriculture, commodities and services) by government are included under the sector public administration data. Information of government expenditure for 2007 fiscal year ( ${}_{NA}gC^{07}$ ) is thus used to derive government consumption by 57 SAM activities for 2006/07 ( $gC_K^{07} = {}_{NA}gC^{07}$ ).

Exports of Goods and Services: Information on exports of goods for 2007 ( ${}_{UN\_COMTRADE}E_E^{07}$ ) is obtained from Export of Commodities by 6-digit level, collated by Detail Export-Import figure (HS 6 Digit) reported by UN-COMTRADE (*http://comtrade.un.org*) database. Again the sector classification of UN-COMTRADE is different from the 57 SAM classifications. Hence a mapping scheme linking the UN-COMTRADE classification to SAM classifications is used to derive exports by 57 SAM commodities for 2007.

$$E_k^{07} = {}_{UN\_COMTRADE}E_E^{07} \quad (7)$$

Investment: National account experts and Input-output and SAM builders are well conversant to the special treatment of goods and services with respect to capital formation and stock change. It is well known that only goods can be stored. Furthermore, only some specific goods can generate investment or form capital which assists further production. On the other hand, services must be consumed instantaneously implying that it cannot be stored and hence last for longer time duration to be able to form capital. National accounts section contains information on origin of capital formation or investment, stock change and valuables for 2007. These information is used to derive gross fixed capital vector invoking 2000 IOT shares (i.e. $I_K^{07} = shI_K^{2k} \cdot I^{07}$ ).

Final Demand: Above estimates of consumption, exports and investment are added together to derive final demand vector for the 57 SAM commodities ( $FD_K^{07}$ ). This is specified as:

$$FD_K^{07} = pC_K^{07} + gC_K^{07} + E_K^{07} + I_K^{07} \quad (9)$$

Intermediate Input Demand: Final demand ( $FD_K^{07}$ ) has been deducted from the total supply ( $SS_K^{07}$ ) to derive intermediate input demand by 57 SAM commodities ( $ID_K^{07} = SS_K^{07} - FD_K^{07}$ ). The resulting input demand in the first instance did not produce equality between supply and demand vectors. Hence an iterative balancing technique was used to re-estimate the input demand vector such that use of it ensures the equality between sectoral supply and demand. In this process specific elements

of the consumption vector, value added vector and intermediate input vector have been modified not only to ensure supply-demand but also to restrict significant deviation of the technical coefficients from the observed realities. The finalized estimates of the intermediate input demand are then added to the estimates of final demand to equate demand and supply ($ID_K^{07}$ + $FD_K^{07}$ - $SS_K^{07}$ = 0). The estimates of demand are reported in the table below.

The estimates of demand by major components are reported in the table below.

**Table 5: Total Demand and Components**

(Million Rupees)

| Commodity | IntDD07 | Cp2007 | Cg2007 | GFC07* | Export07 | FD07 | TDD |
|---|---|---|---|---|---|---|---|
| Paddy Cultivation | 28136 | 17992 | 0 | 1031 | 14 | 19036 | 47172 |
| Wheat Cultivation | 3088 | 10517 | 0 | 308 | 288 | 11113 | 14201 |
| Other Grain Cultivation | 5384 | 15999 | 0 | 612 | 255 | 16866 | 22250 |
| Vegetable and Fruit Cultivation | 4144 | 54387 | 0 | 1072 | 1118 | 56576 | 60720 |
| Oilseed Cultivation | 4398 | 777 | 0 | 40 | 329 | 1147 | 5545 |
| Sugarcane Cultivation | 1625 | 1952 | 0 | 21 | 5 | 1978 | 3603 |
| Jute and Other Plant Fibres Cultivation | 1720 | 1182 | 0 | 5 | 131 | 1319 | 3038 |
| Other Crop Cultivation | 6687 | 44726 | 0 | 390 | 673 | 45790 | 52476 |
| Cattle Rearing | 4155 | 8706 | 0 | 288 | 134 | 9128 | 13283 |
| Other Animal Product | 10001 | 11393 | 0 | 37 | 292 | 11722 | 21724 |
| Raw Milk | 7142 | 44346 | 0 | 636 | 44 | 45026 | 52167 |
| Wool | 339 | 648 | 0 | 1 | 45 | 694 | 1032 |
| Forestry | 4049 | 5257 | 0 | 118 | 173 | 5548 | 9598 |
| Fishing | 4 | 5902 | 0 | 54 | 217 | 6173 | 6177 |
| Coal Mining | 6 | 51 | 0 | 4 | 89 | 144 | 150 |
| Oil Mining | 22 | 20 | 0 | 341 | 17 | 378 | 400 |
| Gas Mining | 21 | 93 | 0 | 375 | 16 | 484 | 505 |
| Other Mining | 208 | 319 | 0 | 5413 | 580 | 6312 | 6520 |
| Meat | 8 | 2521 | 0 | 0 | 0 | 2521 | 2529 |
| Meat Product | 212 | 1387 | 0 | 0 | 0 | 1387 | 1599 |
| Vegetable Oil Industry | 364 | 10744 | 0 | 762 | 14171 | 25676 | 26040 |
| Dairy Product | 1379 | 11290 | 0 | 163 | 633 | 12086 | 13464 |
| Other Grain Milling | 10780 | 16136 | 0 | 531 | 131 | 16798 | 27578 |
| Sugar Industry | 205 | 2735 | 0 | 80 | 264 | 3079 | 3284 |
| Other Food Product | 5705 | 12938 | 0 | 498 | 3283 | 16718 | 22423 |
| Beverage-Tobacco Product | 2324 | 11492 | 0 | 288 | 1239 | 13019 | 15343 |
| Textile | 4063 | 7375 | 0 | 131 | 5132 | 12638 | 16701 |
| Wearing Apparel | 8243 | 7174 | 0 | 121 | 2709 | 10004 | 18247 |
| Leather Product | 12281 | 7252 | 0 | 55 | 632 | 7940 | 20220 |
| Lumber | 60 | 1044 | 0 | 4036 | 1377 | 6457 | 6517 |
| Paper & Paper Product | 13007 | 3892 | 0 | 89 | 2947 | 6928 | 19934 |
| Petroleum | 0 | 36721 | 0 | 7 | 180 | 36908 | 36908 |
| Chemical and Rubber | 2836 | 1140 | 0 | 597 | 15414 | 17150 | 19987 |
| Mineral Product | 2660 | 4612 | 0 | 7 | 1180 | 5799 | 8460 |
| Iron & Steel | 3202 | 877 | 0 | 7184 | 6 | 8066 | 11268 |
| Non-Ferrous Metal | 13365 | 953 | 0 | 3928 | 170 | 5051 | 18416 |
| Fabricated Metal | 6825 | 2829 | 0 | 6833 | 16 | 9677 | 16503 |
| Motor-Vehicle | 531 | 5025 | 0 | 365 | 0 | 5390 | 5921 |
| Other Transport Equipment | 463 | 3114 | 0 | 0 | 0 | 3114 | 3577 |
| Electronic Equipment | 611 | 4395 | 0 | 2205 | 1389 | 7990 | 8601 |
| Other Machinery and Equipment | 1467 | 2611 | 0 | 475 | 5556 | 8642 | 10109 |
| Other Manufacturing | 121 | 3536 | 0 | 2524 | 69 | 6129 | 6250 |
| Electricity Generation | 21803 | 2657 | 0 | 2213 | 0 | 4870 | 26673 |
| Gas Extraction and Distribution | 541 | 1047 | 0 | 123 | 0 | 1170 | 1711 |
| Water Generation | 1441 | 1121 | 0 | 123 | 0 | 1244 | 2684 |
| Construction | 0 | 4778 | 0 | 135574 | 0 | 140353 | 140353 |
| Trade | 39717 | 35903 | 0 | 8860 | 13188 | 57951 | 97669 |
| Other Transport | 34506 | 32763 | 0 | 5816 | 742 | 39321 | 73828 |
| Water Transport | 1170 | 1479 | 0 | 523 | 82 | 2085 | 3254 |

| Commodity | IntDD07 | Cp2007 | Cg2007 | GFC07* | Export07 | FD07 | TDD |
|---|---|---|---|---|---|---|---|
| Air Transport | 2219 | 8598 | 0 | 385 | 3631 | 12613 | 14832 |
| Communication | 18093 | 23148 | 0 | 1207 | 948 | 25303 | 43396 |
| Financial Intermediaries | 8553 | 1274 | 0 | 0 | 0 | 1274 | 9827 |
| Insurance | 6269 | 26396 | 0 | 0 | 2 | 26398 | 32667 |
| Other Business Services | 45571 | 6762 | 0 | 0 | 5867 | 12628 | 58200 |
| Recreation and Other Services | 17847 | 62796 | 0 | 0 | 0 | 62796 | 80643 |
| Government Services | 3940 | 28038 | 46181 | 0 | 8191 | 82410 | 86349 |
| Dwelling | 32238 | 24541 | 0 | 0 | 0 | 24541 | 56779 |
| **Total** | **405750** | **647361** | **46181** | **196449** | **93567** | **983558** | **1389308** |
| **Share (%)** | **29.2** | **46.6** | **3.3** | **14.1** | **6.7** | **70.8** | **100.0** |

Note: * includes stock change.

## Factors Accounts

Factors of production (FP) play an important role in the process of producing and distributing the fruits of growth and development, i.e. by providing factor services to production activities and in return factors receive value-added in the form of wages and salaries, profits and rents. The level of the distribution is in accordance to the level and kind of endowments; hence, the income subsequently transferred to household groups (i.e. as owners of labour and capital) will be heavily influenced, thereby typifying household behaviour.

The FP can be classified into three main categories of factor ownership (a) labour, (b) fixed assets and (c) capital services. Unlike the first the last two are not straightforward. It must be taken into account that only households provide labour services, whereas fixed assets, land and capital services are provided both by households and other institutions (i.e. corporation and government). Classifications of labour types should aim at grouping individuals into homogeneous groups of income earners. For the grouping differences regarding average factor incomes and gender within or between labour groups must be taken into account. Among others, the most important could be labour skills reflecting different occupational categories or different income groups of earners using gender as an additional criterion. More concretely, for most production activities the factor labour can be distinguished according to highly skilled professionals, managers, traders, government employees, personal services employees, blue-collar labourers or street vendors. For agricultural activities these could be agricultural farm owners, farm administrators and land workers of distinct labour types: landless farmers, subsistence farmers, etc. It is should be clear that all or most could be classified according to gender.

Information from developing countries as well as Nepal appears to be no different, inevitably show a high incidence of self-employed or family based activities, hence, differences according to the ownership of fixed assets and capital incomes generated by unincorporated and corporate sectors should be taken into account. Incomes from unincorporated capital (mainly family enterprises) can additionally distinguish imputed wage for the self-employed worker and the remaining capital income. A desirable classification of factors of production is presented below.

**Table 6: A Desirable Factor Classification**

| Labour | Capitalist and Others |
|---|---|
| 1. Self-employed Labour | 1. Unincorporated or mixed income |
| 2. High Skilled Professionals and Managers | 2. Corporate |
| 3. Medium Skilled Professionals and Technicians | 3. Rentiers |
| 4. Government and non-Government Office Clerks | |

| Labour | Capitalist and Others |
|---|---|
| (employees) | |
| 5. Workers (Transport Workers, Mechanics and Other Industrial Workers) | |
| 6. Artisans and Handicraftsmen | |
| 7. Informal (Street-vendors and non economic services n.e.s.) | |
| 8. Agricultural Owners/Administrators | |
| 9. Agricultural Workers | |
| 10. Agriculture Subsistence farmers | |

Even though the above classification of factors appears to be desirable it was not possible at this point to derive a desirable classification of factors as stated above. In the present version of the SAM 2007 the factors are classified into one aggregate type of labour, one aggregate type of capital and one aggregate type of land.

Factor Income by Activities: Detailed information on sectoral employment for the different factor categories was extracted from the 2000 IOT and the Nepal and Labour Force Survey 2008. The information of the two above sources are added together to define a factor-sector share matrix ( $shyF_{Fk}$)[3]. Derived value added vector by 57 SAM activities for 2007 ($VA_K^{07}$) is distributed among 3 factor types using the factor-activity share matrix ($shyF_{Fk}$) to generate the factorial income matrix by activity for 2007 ( $yF_{Fk}^{07}$). The derivation is shown below.

$$yF_{Fk}^{07} = shyF_{Fk} \cdot VA_K^{07} \qquad (10)$$

Distribution of sectoral value added by the 3 representative factors and 57 activities is reported below.

**Table 7: Estimates of Factor Incomes by Activities**

(Million Rupees)

| | Labour | Capital | Land | Value Added |
|---|---|---|---|---|
| Paddy Cultivation | 22160 | 4136 | 12228 | 38525 |
| Wheat Cultivation | 7918 | 1376 | 1980 | 11274 |
| Other Grain Cultivation | 12440 | 2247 | 4224 | 18912 |
| Vegetable and Fruit Cultivation | 8418 | 8518 | 20661 | 37598 |
| Oilseed Cultivation | 2028 | 556 | 1806 | 4390 |
| Sugarcane Cultivation | 1007 | 510 | 1286 | 2802 |
| Jute and Other Plant Fibres Cultivation | 1474 | 517 | 654 | 2645 |
| Other Crop Cultivation | 16907 | 8413 | 15718 | 41039 |
| Cattle Rearing | 6171 | 109 | 1184 | 7464 |
| Other Animal Product | 6197 | 2702 | 5115 | 14014 |
| Raw Milk | 17236 | 5100 | 7367 | 29703 |
| Wool | 91 | 30 | 82 | 203 |
| Forestry | 1755 | 6320 | 0 | 8075 |
| Fishing | 1574 | 1612 | 0 | 3186 |
| Coal Mining | 9 | 36 | 0 | 44 |

[3] Following the symbols used in the Input-output reports on Nepal SAM (2007), please note F, K, H respectively denote factor, activity-commodity, and household groups.

| | Labour | Capital | Land | Value Added |
|---|---|---|---|---|
| Oil Mining | 15 | 128 | 0 | 143 |
| Gas Mining | 28 | 176 | 0 | 204 |
| Other Mining | 357 | 2563 | 0 | 2920 |
| Meat | 204 | 304 | 0 | 508 |
| Meat Product | 225 | 357 | 0 | 582 |
| Vegetable Oil Industry | 479 | 1030 | 0 | 1509 |
| Dairy Product | 423 | 1866 | 0 | 2289 |
| Other Grain Milling | 893 | 5731 | 0 | 6624 |
| Sugar Industry | 151 | 572 | 0 | 723 |
| Other Food Product | 326 | 950 | 0 | 1276 |
| Beverage-Tobacco Product | 399 | 910 | 0 | 1309 |
| Textile | 1486 | 722 | 0 | 2207 |
| Wearing Apparel | 985 | 2376 | 0 | 3360 |
| Leather Product | 386 | 1193 | 0 | 1578 |
| Lumber | 129 | 315 | 0 | 444 |
| Paper & Paper Product | 530 | 1784 | 0 | 2314 |
| Petroleum | 11 | 30 | 0 | 41 |
| Chemical and Rubber | 767 | 3047 | 0 | 3815 |
| Mineral Product | 533 | 820 | 0 | 1353 |
| Iron & Steel | 82 | 617 | 0 | 699 |
| Non-Ferrous Metal | 585 | 7226 | 0 | 7811 |
| Fabricated Metal | 802 | 8653 | 0 | 9455 |
| Motor-Vehicle | 211 | 619 | 0 | 830 |
| Other Transport Equipment | 150 | 200 | 0 | 350 |
| Electronic Equipment | 76 | 85 | 0 | 161 |
| Other Machinery and Equipment | 52 | 353 | 0 | 405 |
| Other Manufacturing | 283 | 637 | 0 | 920 |
| Electricity Generation | 1804 | 10219 | 0 | 12023 |
| Gas Extraction and Distribution | 137 | 409 | 0 | 546 |
| Water Generation | 301 | 1514 | 0 | 1815 |
| Construction | 11214 | 32494 | 0 | 43708 |
| Trade | 45040 | 39751 | 0 | 84791 |
| Other Transport | 15913 | 36422 | 0 | 52336 |
| Water Transport | 1035 | 686 | 0 | 1721 |
| Air Transport | 1870 | 2960 | 0 | 4830 |
| Communication | 4031 | 8492 | 0 | 12523 |
| Financial Intermediaries | 396 | 631 | 0 | 1026 |
| Insurance | 6762 | 15801 | 0 | 22563 |
| Other Business Services | 11049 | 18354 | 0 | 29403 |
| Recreation and Other Services | 15978 | 10858 | 0 | 26836 |
| Government Services | 45141 | 13328 | 0 | 58469 |
| Dwelling | 10095 | 39110 | **0** | 49205 |
| **Value Added** | **286721** | **316472** | **72305** | **675498** |
| **Share (%)** | **42.4** | **46.9** | **10.7** | |

## Institutions Accounts

Current account transactions are captured between 3 institutional agents; households and unincorporated capital, government and the rest of the world. Household account includes 8

representative groups (6 rural and 2 urban). One consolidated capital account is also defined to capture the flows of savings and investment by institutions and the rest of the world respectively.

## Household Accounts

Households (HHs) should be conceptualized as consumption units, different from income earning agents (e.g. labourers, rentiers and capitalists), which receive "transfers" from the factor of production which they own and "sell" to production activities. This distinction is important because the income sources of earning agents can be diverse, (as many as the activities which use the factor(s) owned by the agents), while 'income' to households (viewed as a group of income earning agents) may come from the different factor endowments which the members of the household possess and may simultaneously come from several factor endowments.

Generally, in specifying household classifications the following criteria are considered:

1) Regional differences, i.e. urban and rural households;
2) Educational level of the head of the household;
3) Gender of the head of the household; and
4) Access to productive forms of material wealth particularly, agricultural land and land rights.

The above criteria can be justified on the grounds that:

a) Urban-rural income differentials are usually large. The average per capita disposable income of urban households is considerably higher than that of rural households. And often female headed household are more vulnerable;
b) Among the factors that can help to generate homogeneity the most relevant appear to be classifications according to homogeneity in consumption expenditure or savings patterns;
c) In urban areas differences in household income levels and consumption patterns are closely related to the educational level of the household head, while for rural households the size of farm landholdings appears to be most significant determinant; and
d) Significant differences in consumption pattern and in income generating capacity are found between those rural households primarily engaged in agricultural activities and those whose main income source is derived from non-agricultural activities.

The 2007 SAM distinguishes eight household types, classified according to location and occupation of the household's head. Household classifications contained in SAM 2007 are based on NLSS-II classifications (NLSS2, 2003). The details are provided in the table below.

**Table 8: Household Types and Their Definition**

| SAM HH Classification | HIES Classification |
|---|---|
| Landless Farmer | Landless Farmer |
| Small Farmer | Marginal Farmer (less than 0.5 Bigha Land) |
| Medium Farmer | Small Farmer (Having land between 0.51 and 2.50 Bigha) |
| Large Farmer | Large Farmer (more than 2.51 Bigha) |
| Low Education | Low Education (Education of household head <= class 10) |
| Medium Education | Medium Education (Education of household head having both Secondary School Certificate and Higher Secondary certificate) |
| High Education | High Education (Education of household head having Bachelor and higher degrees ) |

Main sources of household's income are factor returns and various transfer from domestic and external institutions. Generation of household income from these sources is discussed below.

Household Income from Factors: Direct factor incomes (i.e. wages, mixed income and land rents) constitute the major source of household income. Compensation to employees or labour factor payments is paid entirely to the household groups, as they are the only suppliers of the labour factor. Control totals for these three types of factor-incomes are already estimated above which must be distributed among the 7 representative households according to their factor endowments. Factor endowment information ($shfY_{FH}$) are contained in NLSS-II 2003. Control totals for factor income ($yF_{Fk}^{07}$) are applied on the factor endowment shares to generate households income from factors ($fY_{FH}^{07} = shfY_{FH} \cdot \sum_{K} yF_{FK}^{07}$). This procedure ensures that the observed factor endowment structure (i.e. reflecting the factorial income distribution) of 2003 as well as the factor control totals for 2007 are preserved.

Household Receipts from Other Sources: Besides factor incomes, households also receive income from other sources, namely remittances or factor incomes from abroad, government transfers and transfers from the corporations. Information of foreign remittance for 2007 fiscal year ($rowR^{07}$) is obtained from the 'national accounts'. Remittance share information by household groups ($shfR_H$) are contained in NLSS 2003. Control totals for remittance ($rowR^{07}$) are applied on the remittance shares to generate households income from remittance ($rowR_H^{07} = shfR_H \cdot_{row} R^{07}$). This procedure ensures that the observed remittance structures of 2003 as well as the remittance control totals are preserved.

Similar procedures are also applied to distribute institutional transfers by representative household groups. Again institutional transfer (i.e. by government) share information by the representative household groups are obtained from NLSS-II 2003. Control totals for the institutional transfers are applied on these shares to generate households' income from government transfers ($gTr_H^{07} = shgTr_H \cdot_{NA} gTr^{07}$). Total receipts by household groups are derived from all the above sources and this is defined as:

$$R_H^{07} = \sum_F fY_{FH}^{07} + rowR_H^{07} + gTr_H^{07} \qquad (10)$$

Estimated household's receipts from different sources are provided in table below.

**Table 9: Estimates of Household's Receipts from Different Sources**

(Million Rupees)

| Household Groups | Labour Income | Capital Income | Land Income | Government Transfer | Remittance | Total |
|---|---|---|---|---|---|---|
| Rural Land Less | 102523.9 | 29631.9 | 0.0 | 1800.0 | 19562.4 | 153518.3 |
| Rural Land Small | 63051.7 | 14178.1 | 1667.6 | 1280.0 | 17786.2 | 97963.6 |
| Rural Land Medium | 74015.2 | 120822.4 | 29750.2 | 960.0 | 35643.4 | 261191.3 |

| Household Groups | Labour Income | Capital Income | Land Income | Government Transfer | Remittance | Total |
|---|---|---|---|---|---|---|
| Rural Land Large | 4349.6 | 63296.9 | 33772.9 | 680.0 | 9899.6 | 111999.0 |
| Urban Lower Educated | 28609.0 | 6572.8 | 1688.2 | 1480.0 | 4736.7 | 43086.7 |
| Urban Medium Educated | 11331.4 | 26356.5 | 2502.6 | 1200.0 | 1942.0 | 43332.5 |
| Urban Higher Educated | 2840.2 | 55612.8 | 2924.0 | 600.0 | 3078.8 | 65055.8 |
| **All Households** | **286721.0** | **316471.5** | **72305.5** | **8000.0** | **92649.2** | **776147.2** |
| **Share (%)** | **36.9** | **40.8** | **9.3** | **1.0** | **11.9** | **100.0** |

Household Expenditure Pattern: Consumption expenditure constitutes the major component of their outlays. Consumption expenditure by the 7 representative household groups and 57 SAM commodities is estimated using the expenditure structure contained in NLSS 2003. NLSS 2003 provides detailed breakdown of expenditure by 7 household groups and products. In particular, the product classifications adopted in NLSS which are different are mapped to 57 SAM commodity groups. Household consumption by 57 SAM commodities ( $pC_K^{07}$ ) has already been derived using the private consumption control total and the private consumption structure for the 57 SAM commodities. Derived consumption vector is then distributed among the 7 household groups using their derived expenditure structures ( $shpC_{HK}$ ). The procedure generates a consumption matrix for 2007 by 7 representative household groups and 57 SAM commodities ( $pC_{HK}^{07} = shpC_{HK} \cdot pC_K^{07}$ ).

Household Outlays: Other notable expenditures incurred by household groups are income tax payment. Income tax payment shares contained in NLSS 2003 ( $shdT_H$ ) and NA income tax payment control total ( ${}_{NA}dT^{07}$ ) are used to derive income tax payments by household groups ( $dT_H^{07} = shdT_H \cdot {}_{NA}dT^{07}$ ).

Total outlays by household groups are defined as:

$$P_H^{07} = \sum_K pC_{HK}^{07} + dT_H^{07} \qquad (11)$$

Household savings are determined by deducting household payments from household income in such way that savings close the account as well as reflect a savings pattern reflected in NLSS 2003. The household's outlays by these three categories are shown in Table 10.

**Table 10: Estimates of Household's Outlays by Categories**

(Million Rupees)

| Household Groups | Consumption | Direct Tax | Savings | Total Outlay |
|---|---|---|---|---|
| Rural Land Less | 151743.4 | 0.0 | 1774.9 | 153518.3 |
| Rural Land Small | 90258.1 | 0.0 | 7705.4 | 97963.6 |
| Rural Land Medium | 209757.6 | 350.0 | 51083.7 | 261191.3 |
| Rural Land Large | 78994.9 | 4500.0 | 28504.2 | 111999.0 |
| Urban Lower Educated | 39574.9 | 500.0 | 3011.8 | 43086.7 |
| Urban Medium Educated | 33790.7 | 2650.0 | 6891.8 | 43332.5 |
| Urban Higher Educated | 43241.4 | 8000.0 | 13814.4 | 65055.8 |
| **All Households** | **647361.1** | **16000.0** | **112786.1** | **776147.2** |
| **Share (%)** | **83.4** | **2.1** | **14.5** | |

## Other Institutions Accounts

Receipts and outlays of other three current institutions are discussed below.

Government Account: Sources of government income include tax and non-tax revenues. The main sources of tax revenue are (i) indirect taxes on imports and domestic production and (ii) direct taxes in the form of personal income taxes. Amounts for all of the four elements of tax revenues (i.e. $IT_K^{07}$, $dM_K^{07}$ and $dT_H^{07}$) are already defined in the supply-demand section. The main sources of other than tax revenue are the income from the government owned corporations, financial institutions etc. Moreover, part of the value added which accrues to government in accordance to her participation in the production process is also included under the 'non tax' head. However, due to data limitation the non-tax contributions could not be ascertained in this exercise. Hence government income refers to tax revenue only. Total government receipt ( $gR^{07}$ ) is thus defined as:

$$gR^{07} = \sum_K IT_K^{07} + \sum_K dM_K^{07} + \sum_H dT_H^{07} \qquad (12)$$

Government spends most of her income on purchase of goods and services ( $gC_K^{07}$ ) and transfer programmes ( $gTr_H^{07}$ ). Rest of the income constitutes government savings. Government savings ( $gS^{07}$) act as the balancing factor between its receipts and outlays. The balancing condition envisages that receipt must equate the outlay. This is specified as:

$$gR^{07} - \sum_K gC_K^{07} + \sum_H gTr_H^{07} + gS^{07} = 0 \qquad (13)$$

Rest of the World Account: Rest of the world account records inflow and outflow of foreign resources in a country in a fiscal year. The major sources of inflows are: imports of goods ( $M_K^{07}$ ) and services and foreign assistance (i.e. $rowS^{07}$ also known as foreign savings). Major form of outflow includes exports of goods and services ( $E_K^{07}$ ), net factor returns and net current transfer (remittances). Amounts for all of these four elements which are defined above are assembled in this account to complete the account as well as to verify its balance. The balancing condition envisages that sum of inflows must equates the sum of the outflows. This is specified as:

$$\sum_K M_K^{07} + rowS^{07} - \sum_K E_K^{07} + \sum_{FK} yF_{Fk}^{07} + \sum_H rowR_H^{07} = 0 \qquad (14)$$

## Some Key Features of SAM 2007

Salient features of the SAM 2007 are discussed here in terms of economic structure and the household profile.

**Demand and Supply Structure**

Thestructures of demand and supply of 2007 are reported in Table 11 and Table 12. Key observations are discussed below.

**Table 11: Composition of Demand in Various Data Sets**

(In percent)

| Demand Composition | NA 07 | SAM 07 |
|---|---|---|
| **Final Demand Composition** | | |
| *Private Consumption* | 65.8 | 65.8 |
| *Public Consumption* | 4.8 | 4.7 |
| *Exports Goods and Services* | 9.8 | 9.7 |
| *GFC* | 19.6 | 19.8 |
| *Statistical Discrepancy* | 0 | 0 |
| Total Final Demand | 100.00 | 100.00 |
| **Demand Composition** | | |
| *Intermediate Demand* | '...' | 33.5 |
| *Final Demand* | '...' | 66.5 |
| Total Demand | 100.00 | 100.00 |

Source: SAM 2007 and Consolidated Account of Nation of Nepal.

- According to national account 2007 (i.e. first column of the above table), total consumption (private + public) accounted for about 71 percent of final demand of Nepal in 2007. Total investment is around 20 percent of final demand. The share of exports is around 10 percent.

- A desirable property of a SAM is the exact or close association between NA values and SAM values. The final demand composition of SAM 07 is shown in the second column of the above table. The largest component of final demand i.e. the private consumption component of the SAM 07 preserved exact correspondence with their counterpart values in NA 07. The SAM 07 values of other three components showed very close correspondence with their counterpart values in NA 07. Very small discrepancies noted above are due to the re-adjustment of some of the stock change values.

**Table 12: Composition of Supply in Various Data Sets**

(In percent)

| Supply Composition | NA 07 | SAM 07 |
|---|---|---|
| **GDP Composition** | | |
| GDP at Factor Cost | 92.8 | 92.8 |
| Indirect Tax less Subsidies | 7.2 | 7.2 |
| Gross Domestic Product | 100.0 | 100.0 |

| Supply Composition | NA 07 | SAM 07 |
|---|---|---|
| **Factor Income Composition** | | |
| Compensation to Employees (Labour Income) | 42.2 | 42.4 |
| Operating Surplus (Capital Income) | 57.8 | 57.6 |
| Factor Income | 100.0 | 100.0 |
| **Supply Composition (Excluding Intermediate Use)** | | |
| *Domestic* | 75.9 | 75.8 |
| *Imports* | 24.1 | 24.2 |
| Total Supply | 100.0 | 100.0 |
| **Supply Composition** | | |
| *Intermediate Use* | '----' | 33.5 |
| *Final Use (including taxes, tariff, imports etc.)* | '----' | 66.5 |
| Total Supply | 100.0 | 100.0 |

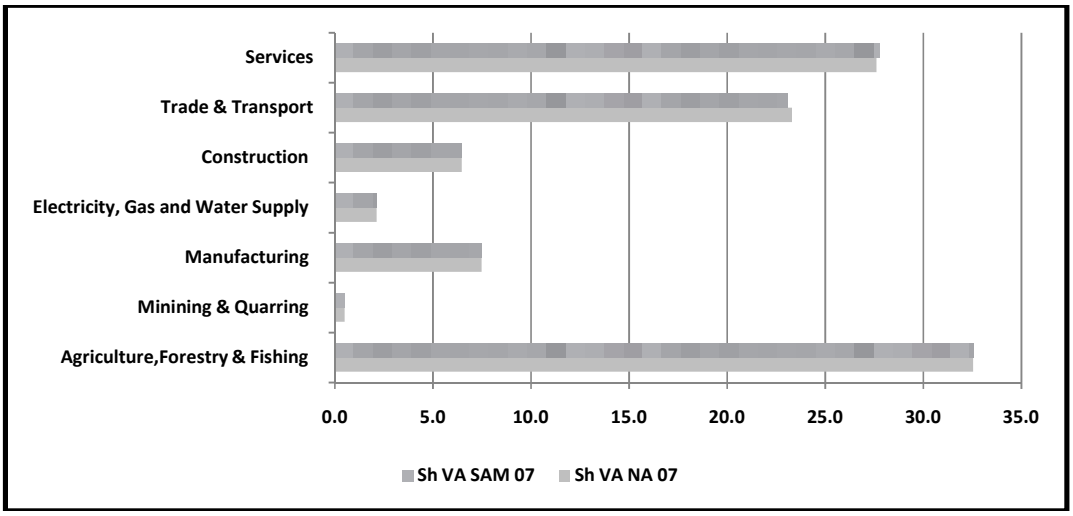
Source: SAM 2007 and Consolidated Account of Nation - of Nepal.

- The largest component of GDP is factor returns which accounted for about 93 percent in 2007. The share of the net indirect tax has been around 7 percent in 2007. Decomposition of factor income by labour and capital sources suggests that returns of capital and labour factors are is around 58 percent and 42 percent respectively.
- Again the desirable property of exact/close association between NA values and SAM values has been preserved for the GDP and supply compositions in SAM 07.
- Decomposition of supply by domestic and external sources also reveals close correspondence between NA values and SAM estimates between for 2007. The share of imported supply in 2007 is 24 percent while the domestic supply in 2007 is around 76 percent.

**Structure of 2007 Economy by Key Sectors**

The economic structure of Nepal as contained in SAM 2007 by 57 producing activities is presented by 7 broad sectors for comparison with national account data for the same year. According to the SAM 2007 data, all service sectors (i.e. including trade and transport) together accounts for about 51 percent of gross domestic product. National account also reports 51 percent contribution by service sectors. *The service sector has thus emerged as the leading sector in Nepal for income generation.* Service sector is followed by agriculture sub-sector accounting for about 33 percent of GDP. The contribution of manufacturing sub-sector is around 7.5 percent of GDP. Construction sub-sector with 6.5 percent contribution closely follows the manufacturing sub-sector. National account estimates also report 33, 7.5 and 6.5 percent contributions by agriculture, manufacturing and construction sub-sectors respectively. Exact correspondences between national account data and SAM 2007 for other sub-sectors are also found and reported below. Establishing exact or very close correspondence between national account estimates and SAM is an important criterion to validate the SAM data base.

**Figure 1: Value added shares by NA 07 and SAM 07**




The desirable characteristic of the exact or close correspondence between national account data and estimates generated by the SAM has been preserved in Nepal SAM 2007.

**Activity Level Endogeneity Degree and Linkages**

The representation of economic structure of an economy as contained in a SAM is best understood by assessing the activity level endogeneity degree and backward linkage. To proceed with the analysis of multipliers and linkages it is necessary to calculate the matrix of technology coefficients (e.g. Leontief I-O technology coefficients). The inverse of the coefficient matrix after deducting for the identity matrix represents the so-called matrix of production multipliers.

The backward linkages, which are the total column sum of the inverse, provide valuable information about the degree of integration of an activity across and with the rest of the economy. Using this indicator it is possible to determine which activities contribute most to growth as a result of an exogenous increase in final demand, say exports. Forward linkages on the other hand help us to understand the importance of a commodity for the rest of the economy in terms of intermediate demand or marketing. Therefore a commodity that exhibits high forward linkages it is said to be important in the process of expansion or high growth, in this context potential bottleneck can be identified.

List of activities with highest backward linkages are shown in table below.

**Table 13: Ten Economic Activities with the Highest Backward Linkage SAM 07**

| Activity | Endogeneity Degree | Backward Linkages | Forward Linkages |
|---|---|---|---|
| Leather Product | 0.8382 | 3.9973 | 3.3142 |
| Meat | 0.7743 | 2.1834 | 1.0013 |
| Dairy Product | 0.7089 | 2.1422 | 1.0906 |
| Beverage-Tobacco Product | 0.6795 | 2.1060 | 1.3820 |
| Construction | 0.6182 | 1.9750 | 1.0000 |
| Communication | 0.6479 | 1.9667 | 1.2813 |
| Lumber | 0.8471 | 1.9641 | 1.0023 |
| Paper & Paper Product | 0.7565 | 1.9115 | 1.4427 |
| Meat Product | 0.5934 | 1.8790 | 1.0106 |
| Non-Ferrous Metal | 0.5309 | 1.8478 | 2.3754 |

- The activities with backward linkages over 2.0 are Leather Products, Metal, Dairy products and beverage and tobacco etc. In economic terms these are the activities to be incentivized if fast growth is a strategy. However, due consideration has to be given to the importance of the sector in the total economy.

- The highest degree of endogeneity, 65% and higher is observed for several manufacturing commodities and some primary activities. The finding seems to support the thesis that manufacturing of primary activities with high input structure tend to have higher backward linkages.

- Activities with higher (highest) backward linkages usually are associated with lower (lowest) forward linkages. Except for few activities, such inverse associations between the backward and forward linkages are also found in the case of SAM 2007.

Table below shows the list of activities with lowest backward linkages.

**Table 14: Ten Economic Activities with the Lowest Backward Linkage SAM 07**

| Activity | Endogeneity Degree | Backward Linkages | Forward Linkages |
|---|---|---|---|
| Chemical and Rubber | 0.1137 | 1.1449 | 1.1253 |
| Other Transport | 0.1027 | 1.1403 | 2.8631 |
| Gas Mining | 0.1161 | 1.1397 | 1.0296 |
| Vegetable and Fruit Cultivation | 0.1090 | 1.1336 | 1.1009 |
| Oilseed Cultivation | 0.1106 | 1.1319 | 1.2854 |
| Other Mining | 0.1041 | 1.1234 | 1.0458 |
| Trade | 0.0747 | 1.1171 | 4.8301 |
| Other Machinery and Equipment | 0.0596 | 1.0865 | 1.1067 |
| Wool | 0.0587 | 1.0739 | 1.0409 |
| Petroleum | 0.0473 | 1.0597 | 1.0000 |

- It is important to note that activities with relatively low backward linkages are associated with low endogeneity degrees. Relatively low backward linkages for these activities may be due to their heavy reliance of imported raw material or higher payments to the primary factors.

- At the other end it is also interesting to see that mainly service activities as well as nature based activities (e.g. gas, crude petroleum etc.) are the one showing the lowest endogeneity degree. In most economies services and natural resources are indeed poorly linked with the rest of the economy; therefore this is not surprising in the case of Nepal.

## Household Receipt and Consumption Pattern

Income and expenditure profiles of the representative households as contained in SAM 07 are provided in Table 15 and Table 16.

**Table 15: Household Income Profile**

(In percent)

| Household Groups | Labour | Capital | Land | Transfer Government | Remittance | Total Income |
|---|---|---|---|---|---|---|
| Rural Land Less | 35.8 | 9.4 | 0.0 | 22.5 | 21.1 | 19.8 |
| Rural Land Small | 22.0 | 4.5 | 2.3 | 16.0 | 19.2 | 12.6 |
| Rural Land Medium | 25.8 | 38.2 | 41.1 | 12.0 | 38.5 | 33.7 |
| Rural Land Large | 1.5 | 20.0 | 46.7 | 8.5 | 10.7 | 14.4 |
| Urban Lower Educated | 10.0 | 2.1 | 2.3 | 18.5 | 5.1 | 5.6 |
| Urban Medium Educated | 4.0 | 8.3 | 3.5 | 15.0 | 2.1 | 5.6 |
| Urban Higher Educated | 1.0 | 17.6 | 4.0 | 7.5 | 3.3 | 8.4 |
| **All Households** | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

- Almost 36 percent of labour income accrues to landless households followed by rural medium farmer (26 percent) and rural small farmers (22 percent). Almost 58 percent of capital income (i.e. mixed income) accrues to the two rural household groups namely rural medium farmer (38 percent); and rural large farmer (20 percent). These three household groups are closely followed by the urban high educated household group receiving around 18 percent capital income.

- Around 60 percent of the government transfers are received by the rural household groups. Two major beneficial rural households are rural landless (23 percent) and rural small farmer household (16 percent). Foreign remittances are received predominantly by the rural household group namely rural medium farmer household (39 percent). Together they receive more than 92 percent of foreign remittance.

**Table 16: Household Outlay Profile**

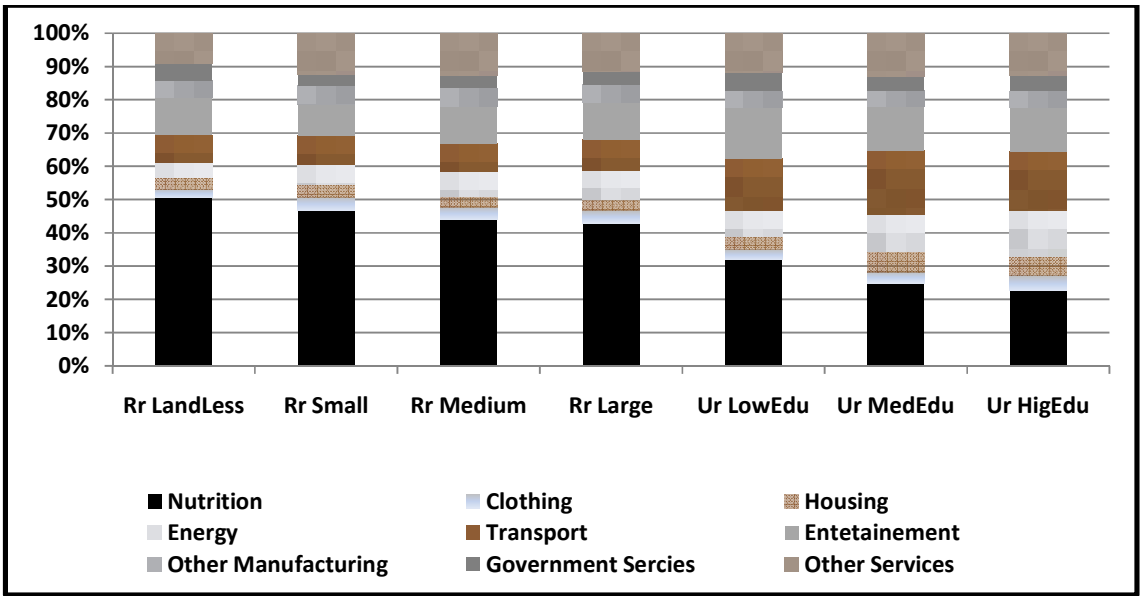
(In percent)

| Household Groups | Consumption | Direct Tax | Savings Rate |
|---|---|---|---|
| Rural Land Less | 23.4 | 0.0 | 1.2 |
| Rural Land Small | 13.9 | 0.0 | 7.9 |
| Rural Land Medium | 32.4 | 2.2 | 19.6 |
| Rural Land Large | 12.2 | 28.1 | 25.5 |
| Urban Lower Educated | 6.1 | 3.1 | 7.0 |
| Urban Medium Educated | 5.2 | 16.6 | 15.9 |
| Urban Higher Educated | 6.7 | 50.0 | 21.2 |
| All Households | 100.0 | 100.0 | 14.5 |

## Consumption Pattern

The basic needs (BN) classification is introduced to capture the situation of the household groups in terms of those wants which characterizes their well being situation. For reasons of importance as well as considering the activity classification, 9 types of wants have been distinguished. The household consumption matrix of SAM 07 has been re-classified by 9 basic needs using a mapping between 57 SAM commodity classification and 9 basic needs classification (please see Annex 1). The consumption by basic needs categories and by seven household groups is shown in figure below.

**Figure 2: Consumption Pattern by Basic Needs and Household Groups**




- On average, households in Nepal spent around 38 percent of their resources on nutrition. Income spent by rural household on nutrition is almost double (i.e. 46 percent) than that spent by their urban counter part (26 percent).

- All four rural households have found to spend more than 40 of their income on nutrition. They are: rural landless (50 percent); rural small farmers (47percent); rural medium (44 percent) and rural large farmers (43 percent). Out of three urban households, only one household has spent more than 26 of their income on nutrition. Urban low education household has spent 32 percent of their income on nutrition.

- Household in Nepal on average spent 18 percent of their total incomes on transport services. Significant differences have been observed between transport expenditure patterns of rural and urban household groups. More specifically, income spent by urban household on transport is almost double (i.e. 16 percent) than that spent by their urban counter part (8 percent).

- On average, households in Nepal spent around 11 percent of their resources on energy. Again, significant differences have been observed between transport expenditure patterns of rural and urban household groups. More specifically, income spent by urban household on transport is almost double (i.e. 10 percent) than that spent by their urban counter part (6 percent).

- Another basic needs on which household in Nepal on average spent around 26 percent of their total incomes is services (i.e. this is a mixed category inclusive of various types of services). Contrary to expectation, no significant differences have been observed between services expenditure patterns of rural and urban household groups.

- On average, households' expenditure on housing is on the lower side in Nepal. There may be under estimation of housing expenditure as imputed values for owner occupied houses are usually under-valued.

## Multipliers and Linkages of SAM 2007

Each of the columns of the matrix of accounting multipliers, as indicated before show the effects of each corresponding exogenous injection on the incomes of endogenous accounts. Analogously to the I-O model the sum total of a column or a row can be calculated and they will be equivalent to the backward and forward income or expenditure linkages. In SAM models within account sums of columns or rows is calculated for each of the four endogenous accounts as well as the total column and row sums of all the endogenous accounts taken together. The former can be called "partial backward or forward linkages" or within account backward or forward linkages and the latter "total backward or forward linkages". As shown in the earlier section, partial backward linkages can also be named after their corresponding account multipliers such as backward and forward linkages for production, factors, and households[5]. Therefore in conclusion we can say that the basic idea of backward linkages is to trace the output increases which occur in supplying sectors or accounts when there is a change in the sector or account using their outputs as inputs, just as with forward linkages we trace the output increases which occur or might occur in using industries or accounts when there is a change in the sector or account supplying inputs[6].

Within the SAM context given an exogenous injection into the system (e.g. government expenditure on education activity) the first effect will be to increase income of the corresponding account (i.e. activity), in turn the increase will trigger off effects on the incomes of all other endogenous accounts namely: (i) activity; (ii) commodity; (iii) factor; and (iv) households. The sizes of total as well as partial backward linkages vary across activities reflecting differences in structure of production (i.e. technology), relationship between value-added and intermediate consumption (i.e. generally the higher the share of value-added in an activity in comparison to intermediate cost, the lower is the value of the multiplier and hence backward linkage), presence of different types of indirect and direct taxes (i.e. indicating size of leakages from the system-the higher the tax rate the lower is the value of multipliers and backward linkages), and savings propensities (i.e. another of leak at the institutional level) of the representative household groups.

Decomposition of total backward linkages among its constituent is reported in Annex 2.

[5] The interpretation of partial (within account) backward and forward linkages within a SAM framework is also similar to that of I-O models. Although the sum of all the elements, in any column (row) of the accounting multipliers matrix, could be read as the backward (forward) linkages of the expenditure-injection multipliers, the interpretation in SAM is not so straight forward because the linkages are composites of the effects of several kinds of accounts.

[6] Bulmer–Thomas, V, (1982),"Input–Output Analysis in Developing Countries", John Wiley & Sons Ltd., New York.

**Annex 1: Mapping between SAM Commodity Classification and Basic Needs Classification**

| Nutrition | Clothing | Housing | Energy | Transport | Entertainment | Other Manufacturing | Government Services | Other Services |
|---|---|---|---|---|---|---|---|---|
| Paddy | | | | | | | | |
| Wheat | | | | | | | | |
| Other Grain | | | | | | | | |
| Vegetables & Fruits | | | | | | | | |
| Oilseed | | | | | | | | |
| Sugar-cane | | | | | | | | |
| Jute and Other Plant Fibers | | | | | | | | |
| Other Crops | | | | | | | | |
| Cattle | | | | | | | | |
| Other Animal Product | | | | | | | | |
| Raw Milk | | | | | | | | |
| | Wool | | | | | | | |
| | | | Forestry | | | | | |
| Fishing | | | | | | | | |
| | | | Coal | | | | | |
| | | | Oil | | | | | |
| | | | Gas | | | | | |
| | | | Other Mining | | | | | |
| Meat | | | | | | | | |
| Meat Product | | | | | | | | |
| Vegetable Oil | | | | | | | | |
| Dairy Product | | | | | | | | |
| Other Grain Mill | | | | | | | | |
| Sugar | | | | | | | | |
| Other Food Product | | | | | | | | |
| | | | | | Beverage-Tobacco | | | |
| | Textile | | | | | | | |
| | Wearing Apparel | | | | | | | |
| | Leather Product | | | | | | | |
| | | | | | | Lumber | | |
| | | | | | | Paper & Paper Product | | |
| | | | Petroleum | | | | | |
| | | | | | | Chemical and Rubber | | |
| | | | | | | Mineral Product | | |
| | | | | | | Iron & Steel | | |
| | | | | | | Non-Ferrous Metal | | |
| | | | | | | Fabricated Metal | | |
| | | | | | | Motor-Vehicle | | |
| | | | | | | Other Transport Equipment | | |
| | | | | | | Electronic Equipment | | |
| | | | | | | Other Mech. & Equipment | | |
| | | | | | | Other Manufacturing | | |
| | | | Electricity | | | | | |
| | | | Gas | | | | | |
| | | | Water | | | | | |
| | | | | | | | | Construct |
| | | | | | | | | Trade |
| | | | | Other Transport | | | | |
| | | | | Water Transport | | | | |
| | | | | Air Transport | | | | |
| | | | | Communi | | | | |

| Nutrition | Clothing | Housing | Energy | Transport | Entertainment | Other Manufacturing | Government Services | Other Services |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Financial Intermed |
| | | | | | | | | Insurance |
| | | | | | | | | Other Business Services |
| | | | | | Recreation and Other Services | | | |
| | | | | | | | Government Services | |
| | | Dwelling | | | | | | |
| **19** | **4** | **1** | **9** | **4** | **2** | **12** | **1** | **5** |

**Annex 2: Linkages of SAM Endogenous Accounts**

| | SAM Endogenous Accounts | Backward Linkages |
|---|---|---|
| 1 | Paddy Cultivation | 10.85 |
| 2 | Wheat Cultivation | 10.77 |
| 3 | Other Grain Cultivation | 10.80 |
| 4 | Vegetable and Fruit Cultivation | 9.76 |
| 5 | Oilseed Cultivation | 9.68 |
| 6 | Sugarcane Cultivation | 9.76 |
| 7 | Jute and Other Plant Fibres Cultivation | 10.84 |
| 8 | Other Crop Cultivation | 10.41 |
| 9 | Cattle Rearing | 11.00 |
| 10 | Other Animal Product | 11.28 |
| 11 | Raw Milk | 10.51 |
| 12 | Wool | 3.44 |
| 13 | Forestry | 10.36 |
| 14 | Fishing | 8.44 |
| 15 | Coal Mining | 5.23 |
| 16 | Oil Mining | 9.68 |
| 17 | Gas Mining | 9.89 |
| 18 | Other Mining | 9.87 |
| 19 | Meat | 11.60 |
| 20 | Meat Product | 11.49 |
| 21 | Vegetable Oil Industry | 6.70 |
| 22 | Dairy Product | 10.89 |
| 23 | Other Grain Milling | 11.68 |
| 24 | Sugar Industry | 10.28 |
| 25 | Other Food Product | 7.56 |
| 26 | Beverage-Tobacco Product | 7.81 |
| 27 | Textile | 7.00 |
| 28 | Wearing Apparel | 9.22 |
| 29 | Leather Product | 10.63 |
| 30 | Lumber | 10.85 |
| 31 | Paper & Paper Product | 9.98 |
| 32 | Petroleum | 2.33 |
| 33 | Chemical and Rubber | 3.71 |
| 34 | Mineral Product | 5.01 |
| 35 | Iron & Steel | 4.64 |
| 36 | Non-Ferrous Metal | 10.81 |
| 37 | Fabricated Metal | 10.50 |
| 38 | Motor-Vehicle | 6.03 |
| 39 | Other Transport Equipment | 3.38 |
| 40 | Electronic Equipment | 2.29 |
| 41 | Other Machinery and Equipment | 2.01 |
| 42 | Other Manufacturing | 9.25 |
| 43 | Electricity Generation | 9.08 |
| 44 | Gas Extraction and Distribution | 9.10 |
| 45 | Water Generation | 10.39 |
| 46 | Construction | 10.61 |
| 47 | Trade | 10.72 |
| 48 | Other Transport | 9.93 |
| 49 | Water Transport | 10.66 |
| 50 | Air Transport | 9.69 |
| 51 | Communication | 10.76 |
| 52 | Financial Intermediaries | 7.32 |

| | SAM Endogenous Accounts | Backward Linkages |
|---|---|---|
| 53 | Insurance | 9.25 |
| 54 | Other Business Services | 10.76 |
| 55 | Recreation and Other Services | 10.27 |
| 56 | Government Services | 10.09 |
| 57 | Dwelling | 10.18 |
| | **Average Activity Backward Linkage** | **8.89** |
| 58 | Paddy Cultivation | 11.64 |
| 59 | Wheat Cultivation | 11.77 |
| 60 | Other Grain Cultivation | 11.65 |
| 61 | Vegetable and Fruit Cultivation | 8.12 |
| 62 | Oilseed Cultivation | 10.68 |
| 63 | Sugarcane Cultivation | 10.76 |
| 64 | Jute and Other Plant Fibres Cultivation | 11.84 |
| 65 | Other Crop Cultivation | 10.52 |
| 66 | Cattle Rearing | 11.20 |
| 67 | Other Animal Product | 11.79 |
| 68 | Raw Milk | 11.29 |
| 69 | Wool | 4.33 |
| 70 | Forestry | 10.90 |
| 71 | Fishing | 9.44 |
| 72 | Coal Mining | 6.23 |
| 73 | Oil Mining | 5.47 |
| 74 | Gas Mining | 5.71 |
| 75 | Other Mining | 6.14 |
| 76 | Meat | 12.57 |
| 77 | Meat Product | 12.34 |
| 78 | Vegetable Oil Industry | 5.71 |
| 79 | Dairy Product | 8.23 |
| 80 | Other Grain Milling | 10.60 |
| 81 | Sugar Industry | 9.34 |
| 82 | Other Food Product | 4.93 |
| 83 | Beverage-Tobacco Product | 3.97 |
| 84 | Textile | 6.08 |
| 85 | Wearing Apparel | 6.98 |
| 86 | Leather Product | 10.25 |
| 87 | Lumber | 10.29 |
| 88 | Paper & Paper Product | 10.27 |
| 89 | Petroleum | 1.03 |
| 90 | Chemical and Rubber | 4.51 |
| 91 | Mineral Product | 5.42 |
| 92 | Iron & Steel | 4.61 |
| 93 | Non-Ferrous Metal | 11.77 |
| 94 | Fabricated Metal | 10.99 |
| 95 | Motor-Vehicle | 4.98 |
| 96 | Other Transport Equipment | 3.58 |
| 97 | Electronic Equipment | 2.92 |
| 98 | Other Machinery and Equipment | 2.73 |
| 99 | Other Manufacturing | 6.12 |
| 100 | Electricity Generation | 9.51 |
| 101 | Gas Extraction and Distribution | 9.02 |
| 102 | Water Generation | 10.93 |
| 103 | Construction | 10.46 |
| 104 | Trade | 11.12 |

| | SAM Endogenous Accounts | Backward Linkages |
|---|---|---|
| 105 | Other Transport | 9.42 |
| 106 | Water Transport | 7.99 |
| 107 | Air Transport | 7.16 |
| 108 | Communication | 11.26 |
| 109 | Financial Intermediaries | 7.79 |
| 110 | Insurance | 9.61 |
| 111 | Other Business Services | 11.17 |
| 112 | Recreation and Other Services | 9.71 |
| 113 | Government Services | 10.80 |
| 114 | Dwelling | 11.18 |
| | **Average Commodity Backward Linkage** | **8.54** |
| 115 | Labour | 10.36 |
| 116 | Capital | 9.04 |
| 117 | Land | 8.84 |
| | **Average Factor Backward Linkage** | **9.41** |
| 118 | Rural Land Less | 10.28 |
| 119 | Rural Land Small | 9.59 |
| 120 | Rural Land Medium | 8.37 |
| 121 | Rural Land Large | 7.33 |
| 122 | Urban Lower Educated | 9.43 |
| 123 | Urban Medium Educated | 7.71 |
| 124 | Urban Higher Educated | 6.50 |
| | **Average Household Backward Linkage** | **8.46** |