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ESTIMATION OF SAM FOR INDIA: AN APPLICATION FOR INDIA'S ENERGY TRANSITION TARGETS

NCAER Working Paper

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Abstract

The Social Accounting Matrix (SAM) for India was historically constructed based on Input-Output table (IO). But from 2011-12, Government of India, is publishing Supply-Use table, instead of input-output table. While erstwhile Input-Output Table published by Government of India had same number of products and industries, Supply-Use table provides one 'Supply matrix' and one 'Use matrix', each of which is a rectangular table with 140 products and 66 industries (for 2018-19). Converting the Supply-Use table to a square Input-Output table and subsequently extending it to Social Accounting Matrix require utilisation of various data sources, application of numerous steps and adjustments, and there are not many literatures on it, despite the usefulness of both IO and SAM matrices in macroeconomic policy design. This study aims to bridge the gap by constructing Input-Output Table and Social Accounting Matrix for India from the Supply-Use table incorporating information from many other sources, and describes the method of construction of the matrices. Our IO and SAM also focus on various energy sectors, including different sources of power generation, biomass etc. and disaggregate energy-intensive sectors like cement or aluminium, considering the immense usefulness of the energy-extended macro structure to research of energy and environment policies. The study focuses on construction of a 59×59 SAM for India, with base year of 2021-22 incorporating 3 factors of production and 10 categories of households. As an application of the newly constructed SAM, we have analysed the employment implication of India's Nationally Determined Contribution (NDC) emission commitments.

Keywords: *Social Accounting Matrix, Input-Output Table, Supply-Use Table, SAM Multiplier, India, Energy*

JEL Classification: *E16, C67, D57*

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1. Introduction

A Social Accounting Matrix (SAM) depicts the entire circular flow of income for an economy in a square matrix format. It shows production leading to the generation of incomes which, in turn, are allocated to institutional sectors. These incomes are either spent on products or saved. The expenditures by institutions lead to production by domestic industries as well as supply from rest of world. Hence, a SAM can be used to analyse the relationship between production structure, income distribution and consumption profile of different household groups in an economy. Unlike a closed input-output (IO) model that uses a single household sector, a SAM typically models households by various occupation/expenditure classes. The literature suggests that an inter-industry analysis can be seriously misleading without incorporating these aspects (Roland-Holst 1990).

An important application of SAM is multiplier analysis. A multiplier analysis enables one to understand the direct, indirect and induced impacts of an exogenous demand shock on the economy. The direct effect is caused by the expansion of production of other activity sectors that need intermediate inputs of the manufacturing process. For example, agricultural production requires inputs of other activities and this demand, in turn, affects production of its inputs. The indirect effects occur due to the relationships between consumption and intermediate demand among the activity sectors. To satisfy the input requirements of the agricultural sector, remaining activities require other inputs and this generates additional production effects. The induced effects occur due to the circular flow of income. The production of each activity generates a feedback process from the incomes of the production factors to the expenditures of the institutional sector and to each activity's own productive process.

A SAM can be used as the database of Computable General Equilibrium (CGE) Models, which are widely used to analyse the aggregate welfare and distributional impacts of policies across various areas like fiscal reform and development planning, international trade, structural adjustment programmes, impact assessment studies, environmental regulations etc. For the above reasons, the construction of SAM has been undertaken by researchers in numerous countries over the past decades. India is not an exception to this work. India was an early leader in the construction of Social Accounting Matrix (SAM).

However, the SAMs for India was historically constructed based on the input-output table along with other data sources. But from 2011-12, Government of India, is publishing Supply-Use table (SUT), instead of the Input-Output table. The two types of tables, though both talk about the structure of Indian economy, are different in structure. While Input-Output Table had same number of products and industries, Supply-Use table provides one 'Supply matrix' and one 'Use matrix', each of which is a rectangular table with 140 products and 66 industries[1]. Converting the Supply-Use table to a square Input-Output table and then extending it to Social Accounting Matrix requires utilisation of various data sources, application of numerous steps and adjustments, and there are not many literatures on it. We wanted to make an updated Social Accounting Matrix which, apart from its usage in policy assessment studies, can be used as an important input to the macro models like Computable General

[1] For 2018-19.

Equilibrium. So, we required the updated SAM, which is benchmarked with macro-data of the year 2021-22. This study aims to construct a Social Accounting Matrix for India from the Supply-Use table while also incorporating information from many other sources, and describes the method of construction of the matrices. A consequent Input-Output table is also generated and presented in the paper.

The focus of our Input-Output Table and the SAM is energy sector. Hence, energy sectors are disaggregated in detail using different data sources and also energy-intensive sectors in the economy like cement or aluminium are disaggregated from their parent sectors. Biomass is also extracted out from different sectors which contribute to the output of the biomass sector. The IO matrix and SAM are thus generated and provided in this paper to the research community, considering the immense usefulness to macroeconomic and policy research, especially in the context of energy and environment policy design.

To our best knowledge, Sarkar and Subbarao (1981) constructed the first SAM for India. Subsequently a number of SAMs were constructed by the different researchers. Table 1 depicts the developments since 2000 decade on a national level[2]. Majority of the papers constructing SAM (after 2000) is based on Input-Output Table (Pradhan, Saluja and Singh 2006; Saluja & Yadav 2006; Sinha, Siddiqui. and Munjal 2007; Pal, Pohit and Roy 2012; Pal and Pohit 2014; Pradhan, Saluja and Sharma 2013; Pal, Ojha, Pohit, & Roy 2015; Pal and Bandarlage 2017). Supply-Use table is utilised in Venkatesh and Pal (2018) and Pal, Pradesha and Thurlow (2020), but with different sectoral emphasis and with different data sources. Majority of the papers considers occupational status of the households as a basis of classification of households as agents (Pradhan, Saluja and Singh 2006; Sinha, Siddiqui. and Munjal 2007; Pal, Pohit and Roy 2012; Pal and Pohit 2014; Pradhan, Saluja and Sharma 2013; Pal, Ojha, Pohit, & Roy 2015). A few studies classified household based on expenditure classes (Saluja & Yadav 2006; Pal and Bandarlage 2017; Pal, Pradesha and Thurlow 2020).

[2] SAM has also been constructed at subnational level for a few states of India. These are not included here.

Table 1: SAMs of India, 2000 Onward

S. No.	Name of researchers and their SAM based study	Salient Features of SAM.
1.	Pradhan, Saluja and Singh (2006)	**Base year:** 1997-98. **Sectors (57 in all):** agriculture (4), livestock products (2), forestry, mining, manufacturing (27), machinery and equipment (6), construction, electricity, transport (2), gas and water supply, other services (11). **Agents:** government, self-employed in agriculture (rural & urban), self-employment in non-agriculture (rural & urban), agricultural wage earners (rural & urban), other households (rural & urban), private corporate, and public non-departmental enterprises.
2.	Saluja and Yadav (2006)	**2. Base year:** 2003-04 **Sectors (73 in all):** agriculture, allied and mining (21), manufacturing (35), construction (1), electricity, gas and water supply (3), transport (2), other services (11). **Agents:** 5 rural households' expenditure classes, 5 urban households expenditure classes, private corporation, public enterprises and government.
3.	Sinha, Siddiqui, and Munjal (2007)	**Base year:** 1999-2000. **Sectors (13 in all):** agriculture (informal), formal manufacturing (9), construction (informal), other services (formal & informal), and government service. **Agents:** casual labour (rural & urban), regular wage earner (rural & urban), own account worker (rural & urban), employer (rural & urban), and government.
4.	Pal, Pohit, and Roy (2012)	**Base year:** 2003-04. **Sectors (85 in all):** agriculture and allied activity (21) mining and quarrying (9), manufacturing (32), Construction (1), Electricity and water supply (5), Transport (5) and Services (12). **Agents:** non-agricultural self-employed (Rural), agricultural labour (Rural), other labour (Rural), agricultural self-employed (Rural), other households (Rural), self-employed (Urban), salaried class (Urban), casual labour (Urban), other households (Urban), Private corporate, Public non-departmental enterprises and Government.
5.	Pal and Pohit (2014)	**Base year:** 2006-07. **Sectors (35 in all):** agriculture livestock products forestry and fishing (7) mining (4), manufacturing including machinery and equipment (12), Hydroelectricity, thermal electricity, nuclear electricity, and biomass (4), water supply, construction, transports (6) and Health and Medical Service; and other services (2). **Agents:** non-agricultural self-employed (Rural), agricultural labour (Rural), other labour (Rural), agricultural self-employed (Rural), other households (Rural), self-employed (Urban), salaried class (Urban), casual labour (Urban), other households (Urban), Private corporate, Public non-departmental enterprises and Government.
6.	Pradhan, Saluja, and Sharma (2013)	**Base year:** 2007-08 **Sectors (78 in all):** Agriculture, Allied Activities (22), and Mining (9), Manufacturing Industries (27), Construction (1), Electricity, and Water Supply (2), Transport (5), Other Sectors (12)

		Agents: Non-agricultural Self-Employed (Rural), Agricultural Labour (Rural), Non-agricultural Labour (Rural), Agricultural Self-Employed (Rural), Other households (Rural), Self-Employed (Urban), Salaried Class (Urban), Casual labour (Urban), Other households (Urban).
7.	Pal, Ojha, Pohit, and Roy (2015)	**Base year:** 2006-07 **Sectors (35 in all):** agriculture livestock products, forestry and fishing (7) mining (4), manufacturing (12), electricity (3), biomass (1), water supply, construction, transports (6) and Services (2). **Agents:** Non-agricultural Self-Employed (Rural), Agricultural Labour (Rural), other labours (Rural), Agricultural Self-Employed (Rural), Other households (Rural), Self-Employed (Urban), Salaried Class (Urban), Casual labour (Urban), Other households (Urban), Private corporate, Public non-departmental enterprises, Government.
8.	Pal and Bandarlage (2017)	**Base year:** 2007-08 **Sectors (78 in all):** agriculture livestock products, forestry and fishing (22) mining (9), manufacturing (26), water supply, construction, transports (7) and Services (13). **Agents:** 10 rural ST households' expenditure classes, 10 rural SC households' expenditure classes, 10 rural OBC households' expenditure classes, 10 rural 'Others' households' expenditure classes, 10 urban ST households' expenditure classes, 10 urban SC households' expenditure classes, 10 urban OBC households' expenditure classes, 10 urban 'Others households' expenditure classes, private corporation, public enterprises and government.
9.	Venkatesh and Pal (2018)	**Base year:** 2012-13 **Sectors (140 in all):** agriculture livestock products, forestry and fishing (29) mining (11), manufacturing (72), electricity (1), water supply, construction, transports (11) and Services (16). **Agents:** household consumers, industries, government, labour, capital and ROW. Institutions comprise households, private corporate sector, public non-departmental enterprises and government.
10.	Pal, Pradesha and Thurlow (2020)	**Base year:** 2017-18 **Sectors (112 in all):** agriculture and allied (39), agriculture-based processing activities (18), mining (4), manufacturing other than agro-processing (24), utilities (3), construction (1) and services including transport and trade (23). **Agents:** 10 expenditure classes for rural farm households, 10 expenditure classes for rural non-farm households and 10 expenditure classes for urban households.

Source: Authors' compilations.

As Table 1 shows, a major shortcoming of the SAMs of India is the aggregate treatment of energy sectors. However, the SAMs constructed by Pal, Pohit, address these shortcomings. However, the renewable energy sectors are not fully disaggregated in these SAMs. However, energy sectors need to be disaggregated if one has to undertake environmental analyses, particularly in view of net zero commitment by India. And also, as mentioned earlier, majority of the SAMs are based on Input-Output table published by Government of India, not the Supply-Use table, which Government of India is publishing since 2011-12, instead of Input-Output table. Therefore, we have constructed a new SAM.

In recent years, many literatures have utilised SAM to analyse and assess the macro-economic impacts of different policies in the context of different countries. For

example, Njoya (2023) utilised SAM for Tanzania for assessing the poverty impact of the COVID-19-induced tourism crisis in Tanzania. Hartono et al. (2020), in the context of Indonesia, analysed the impacts of fossil and renewable energy investments using SAM. Tiku et al. 2022, is also based on SAM multiplier analysis while analysing tourism-induced distribution effects on various socioeconomic groups in West Papua Province. Ferrari et al. (2022) also utilised SAM in their study on the role of tourism in China's economic system and growth. Betho et al. (2022), in their study on macroeconomic impact of COVID-19 in Mozambique through SAM approach has used SAM. Mardones & Brevis (2021) constructed social accounting matrix with environmental accounts for analysing energy and environmental policies in Chile. Morrissey et al. (2019), analysed the distributional impact of investment in the port sector on households in Mauritius through Social Accounting Matrix approach. SAM is considered a very important policy tool for analysing the impact of different policies in macro-economic context, but there is no SAM for India published after 2021, to the best of author's knowledge. The year 2021-22 is chosen as the base-year, also, because that was the 'normal' year after COVID-19. Major contribution of the paper is construction of India's SAM from SUT, which, despite being worked on in some institutes, is not also published in any major journal. One of the major contributions of the paper is that in this paper while preparing SAM from SUT, the conversion of purchaser's prices to basic prices was done after adjusting the Trade and Transport margin and Net Product Tax including Tariff Matrix, following the standard rule used by UN (UN 2018).

The plan of the rest of the paper is as follows. Section 2 discusses materials and methods, which talks about Supply-Use matrix and its link with Social Accounting Matrix, construction procedure of our Input-Output table followed by construction methodology of overall SAM, Section 3 describes the results, with sub-sections on structure of the Indian economy, factor and energy demand analysis using SAM multipliers, employment implication of India's environmental policy target. Finally, section 4 summarises our findings and provides concluding remarks. The Input-Output table and the Social Accounting Matrix are presented in Appendix II & III in the paper, respectively, provided in the Supplementary file.

2. Material and Methods

The methodology of construction of SAM consists of a number of steps, which broadly can be classified as: construction of Input-output table from Supply-Use Table, expansion of energy sector into 7 categories based on the source of generation, bifurcation of biomass from several sectors, and construction of sectors other than production account in SAM. Our study uses the available dataset for India in best way possible with the benchmark of the macro-economic variables, and the step-by-step method is explained in the paper, which can be utilised in the context of other countries as well.

2.1. Supply Use Table and Social Accounting Matrix Framework

The SUT for India[3] includes the following tables: (1) Supply Table at purchasers' price, containing the information on domestic and imported supply of commodities at basic price, commodity-specific taxes and -margins; (2) Use table at purchasers' price, containing the information on use of commodities by users valued at purchasers' price; (3) The value added by industry is presented at the bottom of the Use table. SUTs describe the entire economy by industry and products. The tables show links between components of Gross Value Added (GVA), industry input and outputs and the commodity supply, and the use of these commodities. The Supply table shows where commodities are sourced from either the local market or imported from the rest of the world. The Use table shows the use of these commodities either as an intermediate input in production, used by domestic final consumption or exported to the rest of the world. The basic price is the amount receivable by the producer from the purchaser for a unit of a good or service produced as output, minus any tax payable (i.e. VAT and excise duties), and plus any subsidy receivable, on that unit as a consequence of its production or sale. Basic prices exclude any transport charges involved separately by the producer. The producers' price is the amount receivable by the producer from the purchaser for a unit of a good or service produced as output, minus VAT, or similar deductible tax, invoiced to the producer. It excludes any transport charges invoiced separately by the producer. The purchasers' price is the amount paid by the producer, excluding any deductible VAT or similar deductible tax, in order to take delivery of a unit of good and service at the time and place required by the purchaser. The purchasers' price includes any transport charges paid separately by the purchaser to take delivery at the required time and place. There are 140 commodities and services, and 66 domestic industries or imported from abroad, illustrated in the Supply and Use table in SUT 2018.

A schematic presentation of the Social Accounting Matrix (SAM) is shown in Table 2. Input-Output table corresponds to the production account, and appears in the cell A11 of the schematic SAM. There are four agents in this model economy: households, private corporate, pubic non-departmental enterprises and the government. Factor incomes generated through production process (A21) are transferred to institutions according to the ownership of their factors of production (A32, A42, A52, and A62). Household's income also includes current transfers from the government, interest on public debt (A36) and the net current transfers from the rest of the world (A39). The households spend on consumption of goods and services (A13), and pay direct income taxes (A63) and indirect taxes on purchase (A73) and residual income is saved (A83). Private corporate sector's income consists of operating profit (A42) and interest on public debt (A46). The income, excluding the corporate tax (A64), is its saving (A84). The income of the public-non-departmental enterprises is only the operating surplus (A52), which is same as their saving (A85). The receipts of the government include income from its enterprises (A62), direct taxes of the households and private corporations (A63, A64), the total indirect taxes of the economy (A67) and the net capital transfer from rest of the world (A69). Government spends on its final consumption expenditure on goods and services (A16), transfers and interest payments to households (A36) and interest payments to private corporate sector (A46). The receipts of the capital account comprise net savings of the different institutions (A83,

[3] https://mospi.gov.in/publication/supply-use-tables

A84, A85 and A86), foreign savings (A89), and depreciation (A82). The Capital account expenditure is equal to gross domestic capital formation (A18) and indirect taxes paid on purchases of the investment goods (A78). The rest of the world (ROW) represents the equality between foreign exchange expenditures on one the hand and foreign exchange earnings on the other.

Table 2: A Schematic Social Accounting Matrix (SAM) for India

	Expenditures								
Receipts	**Production Account**	**Factors of Production**	**Households**	**Private Corporate**	**Public Non-Departmental**	**Government**	**Indirect Taxes**	**Capital Account**	**Rest of the World (ROW)**
Production Account	Input-Output Table A11		Private consumption A13			Govt. Consumption A16		Investment A18	Exports A19
Factors of Production	Value added (VA) A21								Net factor Income A29
Households		VA income A32				Govt. transfers, interest on debt A36			Net Current Transfers A39
Private Corporate		Operating Profits A42				Interest on Debt A46			
Public Non-Departmental		Operating Surplus A52							
Government		Income from Enterprises A62	Income and Wealth taxes A63	Corporate Taxes A64			Total indirect taxes A67		Net Capital Transfer A69
Indirect Taxes	Taxes on intermediate A71		Taxes on purchases A73			Taxes on purchases A76		Taxes on investment goods A78	Taxes on exports A79
Capital Account		Depreciation A82	Households Savings A83	Corporate Savings A84	Public non-departmental Savings A85	Government savings A86			Foreign Savings A89
Rest of the World (ROW)	Imports A91								

Since 2011-12, a new series of national accounting is published by National Accounts Division, Ministry of Statistics and Programme Implementation, Government of India, namely Supply-Use table (SUT). The SUT framework describes the production in industries in which intermediate products and primary inputs are required, and utilisation of the produced goods and services as intermediate consumption, final consumption, gross capital formation and exports. Supply Table shows the value of the products by kind of supplier. Entries across the column in a Use Table describe use of the respective product (good or service) in intermediate consumption by industries, final consumption, gross capital formation and exports. The study uses SUT for 2018-19 published by Government of India, where one 'Supply' and one 'Use' table are provided, each encompassing 140 products and 66 industries.

Given the available data, the objectives of our study, and time constraint, we have decided to construct a 59 sectors SAM for India. The base year of our SAM is 2021-22 and it incorporates 3 factors of production and 10 categories of households. Table 3 gives the description of our sectors and its concordance map with 140 products and 66 industries of SUT table of 2018-19.

Table 3: Mapping between SAM Sectors and Sectors of Supply-Use Table

Sec Code	SAM Sectors 2021-22	Product classification of SUT 2018-19	Industry classification of SUT 2018-19	Sec Code	SAM Sectors 2021-22	Product classification of SUT 2018-19	Industry classification of SUT 2018-19
AGR	Agriculture	1 to 19, part of 20	part of 1	**ELN**	Electricity-Nuclear	part of 114	part of 42
FSH	Fisheries	28,29	4	**ELS**	Electricity-Solar	part of 114	part of 42
LIV	Livestock	21 to 23, part of 24	part of 2	**ELW**	Electricity-Wind	part of 114	part of 42
FRS	Forestry	25, part of 26, 27	part of 3	**ELH**	Electricity-Hydro	part of 114	part of 42
BIO	Biomass	part of 20, 24, 26, 27, 50, 66	part of (1, 2, 3, 36)	**ELG**	Electricity-Gas	part of 114	part of 42
COL	Coal	30	5	**ELC**	Electricity-Coal	part of 114	part of 42
OIL	Crude Petroleum	32	6	**ELO**	Electricity-Other	part of 114	part of 42
NGS	Natural Gas	31	7	**RLT**	Railway Transport	120, part of 124	45, part of 49
MIN	Mining	33 to 40	8 to 10	**LNT**	Land Transport	121, part of 124	46, part of 49
TXL	Textiles	56 to 62	17, 18	**WTT**	Water transport	123, part of 124	47, part of 49
PPR	Paper products	part of 66,67	part of 36	**ART**	Air transport	122, part of 124	48, part of 49
PET	Refined Petro Prod	71	30	**TRA**	Trade	117	52
CEM	Cement	82	part of 34	**STW**	Storage/Warehousing	125	50
FRM	Ferrous Metals	84 to 86	20	**COM**	Communication	126	51
ALM	Aluminium	part of 87	part of 21	**HOT**	Hotel and Restaurant	119	53
NFM	Other Non-Ferrous Metals	part of 87	part of 21, 22	**FIN**	Finance & Insurance	127, 128	54, 55
FER	Fertilizer	75	part of 31	**WTD**	Water Distribution	116	44
CHM	Other Chemicals	73,74,76 to 81	part of 31, 32	**DWL**	Dwelling	129, 130	56
MAN	Other manufacturing	41 to 49, part of 50, 51 to 55, 63 to 65, 68 to70, 72, 83, 88 to 112	11 to 16, 19, 23 to 29, 33, part of 34, 35, 37 to 40	**OSV**	Other Services	115, 118, 131 to 140	43, 57 to 66
CON	Construction	113	41				

Source: Authors. The description of 140 products and 66 industries in Supply and Use Table of SUT is given in Appendix I.i. and Appendix I.ii.

The important aspect of our SAM is the decomposition of the electricity sector into seven separate sectors viz. Nuclear, Solar, Wind, Hydro, Gas, Coal and Other. Energy-intensive sectors in the economy like cement or aluminium are disaggregated from their parent sectors. Biomass is also extracted out from different sectors which contribute to the output of the biomass sector.

We have considered 4 broad economic agents in our proposed SAM viz. households, government, public non-departmental enterprises, and private corporations. Moreover, households are decomposed into 10 households group based on their consumption quintiles (Table 4).

Table 4: Description of Economic Agents

Agent code	Description
RH1	Rural, 1st quintile (lowest)
RH2	Rural, 2nd quintile
RH3	Rural, 3rd quintile
RH4	Rural, 4th quintile
RH5	Rural, 5th quintile (highest)
UH1	Urban, 1st quintile (lowest)
UH2	Urban, 2nd quintile
UH3	Urban, 3rd quintile
UH4	Urban, 4th quintile
UH5	Urban, 5th quintile (highest)
PVT	Private corporate
PUB	Public non-departmental enterprises
GOV	Government

Source: Authors.

The underlying assumptions in a SAM model are: (1) prices and expenditure propensities of endogenous accounts are constant; (2) government, rest of the world, and capital accounts are considered to be exogenous, while the factors, institutions and sectoral production activities are endogenous; and (3) production technology and resource endowments are given for a time period (Babu et al. 2018).

2.2. Methodology for Constructing Social Accounting Matrix (SAM)

In our study, the methodology of construction of SAM is primarily based on Pradhan (2006) and Pal, Ojha, Pohit, & Roy (2015). Though these studies prepare SAM from Input-Output table, the basic methodology is similar. Our study prepares SAM from Supply-Use Table, which is an extension of the methodology incorporating the standard methodology of preparation of Input-Output Table from Supply-Use Table (UN 2018). Since, Government of India publishes Supply-Use Table instead of Input-Output Table since 2011-12, our contribution in the literature is to generate a SAM for India from Supply-Use Table. Input-Output Table is a by-product of the exercise. An attempt of developing Input-Output Table from SUT for India for the year 2013-14 has been undertaken by Singh and Saluja (2018), but our objective was to prepare SAM, which

not only provides a broader economic perspective by including income distribution of households, but also generates a basic structure for CGE modelling. So, the SAM for Indian economy is prepared with the base-year of 2021-22.

2.2.1. *Construction of Input-output table from Supply-Use Table*

Both the Supply Table and Use Table of India are product X industry matrices but their entries are different. In the Supply Table, each column presents the values of products (kept in rows) produced by an industry or the products supplied by industries to the economy distinguishing the domestic supply from foreign supply (imports). The supply table documents the availability of individual commodities of goods and services and usually valued at basic prices. The total supply of each product at the purchaser's price has been obtained by adding taxes less subsidies on products and trade and transport margins. On the other hand, a Use Table shows the use of the product (a good or service and kept in rows) by the type of use (kept in columns), that is, as intermediate consumption, gross capital formation, and exports. They are all at purchaser's price.

For transforming rectangular SUTs to square SUTs, we needed to follow two major steps: First, the products included in the SUTs were disaggregated or aggregated in a way so that they represent the characteristic products of industries shown in the columns; and second, the industries included in the columns of SUTs are disaggregated or aggregated in a way so that they correspond to the products shown in the rows. Following either of the step, the resultant square SUT will show in rows, the characteristic products corresponding to the industries included in the columns. The choice of either of the two options depends on the size of the IO table to be compiled from the SUTs. We should also consider that as products included in SUT are often more than the industries in the rectangular SUTs, the option of disaggregating the industries would result in a larger size IO table. Conversely, if products are aggregated to correspond to the industries, the size of IO will be smaller. In general, aggregation approach is preferred, as disaggregation requires lot more efforts in collecting detailed data, and such compilations involved would almost be equivalent to compiling the SUTs afresh. The criterion of any product, to be the characteristics product(s) of an industry or in other words, any industry to be a producer of single or more products, was based on specialisation and coverage ratios based on supply matrix. The specialisation and coverage ratios are share matrices respectively in column totals and row totals. This provides us a mapping between 140 products and 66 industries or vice versa.

The commodity x commodity IO table is constructed following the method suggested in *System of National Accounts*, Studies in Method Series F. No. 2, Revision 3, 1968 (UN) under industry technology.

That, commodity x commodity Flow table is derived as follows:

(BD) q = $X\,(g)^{-1}\,M\,(q)^{-1}\;q = X\,(g)^{-1}\,M$

where,

X is use matrix,

M is supply matrix,

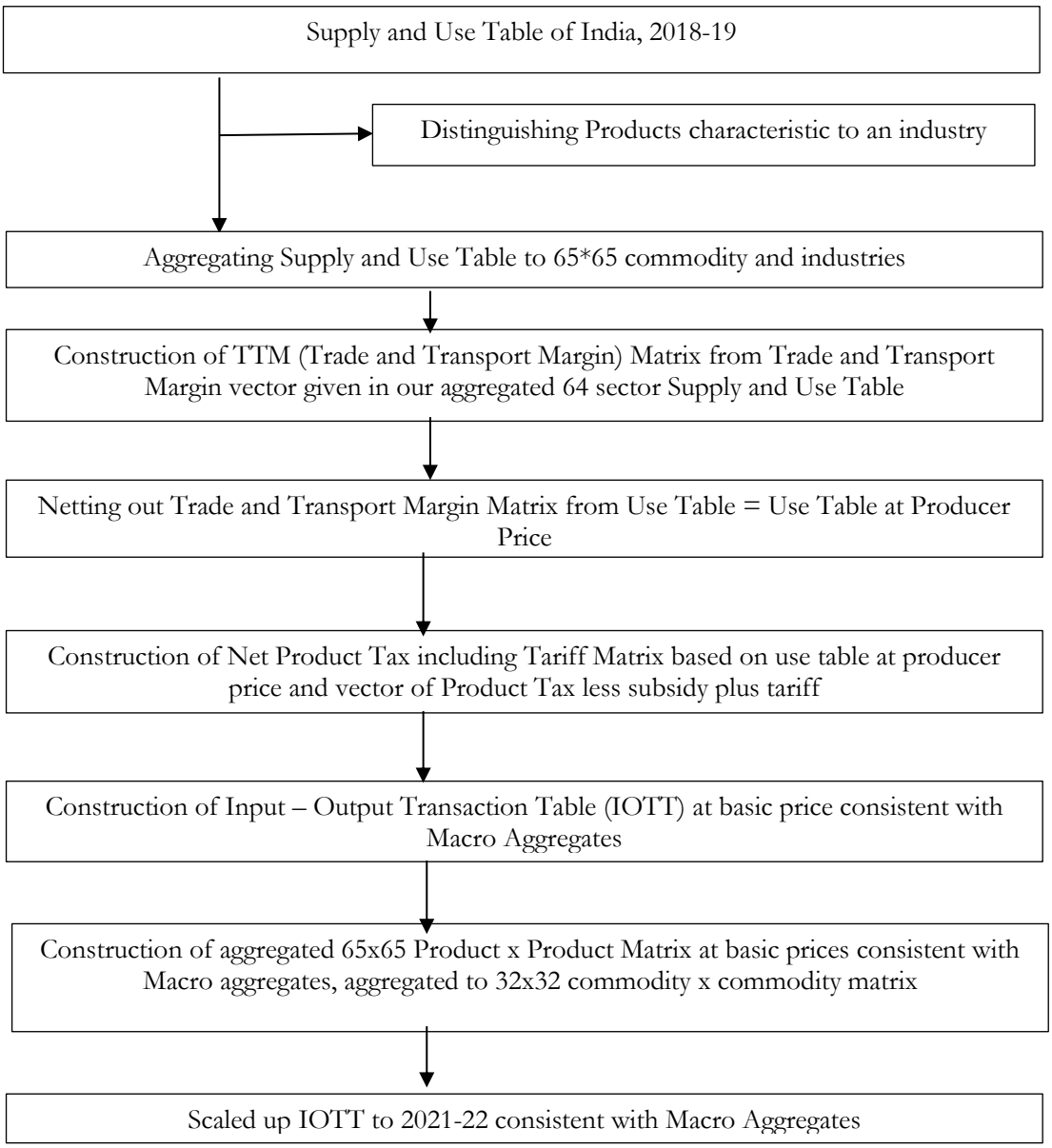
$B = X\,(g)^{-1}$: commodity x industry coefficient matrix, values in the use matrix expressed as coefficient; g is a diagonal matrix with diagonal elements as the elements of vector g; $(g)^{-1}$ is the inverse of the matrix g

D = M $(q)^{-1}$: where q = diagonal matrix with diagonal elements as the elements of vector q; $(q)^{-1}$ is the inverse of the matrix q.

Here, D is basically the Market share matrix, the column of which show proportions in which various industries produce the total output of a particular commodity.

The flowchart of the construction procedure of our SAM begins with the construction of an IO Table from the published SUT of India as shown in Figure 1. As Figure 1 indicates, initially, after aggregation, we have with us one aggregated supply table and one aggregated use table, each with 65x65 dimension. For balancing the two tables and finally bringing them to an analysis, it is essential that both the tables are brought to the same valuation prices using Trade and Transport Margin Matrix and Net Product Tax including Tariff Matrix. The detailed procedure is shown in Figure 1. Here, we want to mention that the sectors like aluminium and cement are not shown as separate sectors/ industries in SUT tables. These have been separated out from their parent sector by drawing on their structure from detailed ASI statistics. Most of these products originate in the registered sector, which are covered in the ASI statistics. We have not made any adjustment in their contribution originating in the unorganised sector. The 32-sector uniform IO table is scaled up to the year 2021-22 using latest national account statistics. The consistency of IO table hence prepared for 2021-22 is further checked for both income and expenditure side.

Figure 1: Flow Chart of the Construction Procedure of Input-Output table



It may be noted that India's SUT table provides only a column "Trade and Transport margin (TTM)" that covers the trade margins and the transport cost of goods, or freight cost, from place of seller to purchaser. For all agriculture and manufactured products, TTM value is a combination of trade and transport margins. For services, TTM value is zero as it involves neither trade nor transport margin. For transport services, TTM depicts transport margins or the freight cost only.

The transport services for which these freight costs are available are: Railway Transport, Road Transport, Water Transport, Air Transport and Supporting and auxiliary transport activities.

The values of TTM for all above items present the values of freight cost for each type of transport as well as the cost of support services for each of the transport services. The support services include services such as switching and shunting (in the case of railways), parking charges (in the case of land transport), fire-fighting services (in the case of air transport), cargo handling in all types of transport services, service charges of travel agents, etc.

The column vector of trade and margin is used to construct the matrix by distributing the column entry using output as control total in the following way:

Let us denote entry in Supply table at basic price (S) by s_{ij}, entry in Use table at purchaser price (U) by u_{ij}, entry in Use table at producer price (U_p) by up_{ij} and Trade and Transport Matrix (TTM) by ttm_{ij}. Then TTM matrix is derived as follows

$$ttm_{ij} = (s_{i\ trade\ and\ transport\ margin\ column\ entry})(u_{i\ j})/(u_{i\ total\ use\ column\ entry} - u_{i\ CIS\ column\ entry})$$

The sum total of the column value is further apportioned using a share of individual margin commodity vis–a-vis row sum of all the margin commodities together. The cell entries for margin sectors in TTMs are placed as negative values. We netted out TTM matrix from use table and further arrived at use table at producer prices. For clarity, the derivation of use table at producer prices (U_p) is mentioned below.

$$up_{i\ j} = u_{i\ j} - ttm_{i\ j}$$

Similarly, we have constructed matrix for net product tax including tariffs by similarly allocating net product tax including tariffs column. We have taken out net product tax matrix from use table at producer prices, which further resulted into use table by product and industry dimensions.

Let NPT, be the matrix for net product tax including tariff. The derivation is as follows.

$$npt_{i\ j} = (s_{i\ product\ tax\ less\ subsidies\ column\ entry} + s_{i\ import\ duty\ column\ entry}) * \left(\frac{up_{i\ j}}{up_{i\ total\ use\ column\ entry}}\right)$$

The use table at producer prices (Up) and NPT are then used to construct IO transaction table at basic prices by deducing taxes from U_p table.

If we define the entry in Use table at basic price (U_b) by ub_{ij}, then

$$ub_{i\ j} = up_{ij} - npt_{i\ j}$$

2.2.2. Expansion of Energy Sector

Having constructed the 32x32 balanced IO table, we have extended the same to match with our desired sectoral scheme, and finally a matrix with 39 production sectors is generated. The procedure is outlined in the following self-explanatory charts (see Figures 2, and 3). The methodology primarily follows Pal et al. (2012), but the energy sector is expanded to generate disaggregated distribution of renewable and non-renewable energy sources of power generation.

Electricity sector is expanded into 7 sectors, namely electricity from coal (ELC), electricity from gas (ELG), electricity from nuclear (ELN), hydro-electricity (ELH), electricity from solar (ELS), electricity from wind (ELW), electricity from other sources (ELO) (Figure 2). For this, Annual Reports of HPCL NPCL, NTPC & of firms engaged in gas-based power, solar/wind electricity are utilised. Gross output of various sources of electricity are estimated using the share of generation a particular source and total output of electricity in our IO table. For example, output from electricity generation from hydro sources are estimated by multiplying the output from total electricity generation with share of hydro in total generation of electricity. For construction of columns in the SAM, Gross Value Added (GVA) values from the Annual Reports are utilised. GVA of the 'other' sector is estimated by subtracting GVA from electricity produced by coal, gas, nuclear, hydro, solar and wind from the total GVA from electricity. Similarly, for intermediate use, data from the same annual reports are utilised, and the estimates for the 'other' sector is derived by similar subtraction. Net indirect tax in total output of electricity sector is distributed among sources based on their outputs' shares in total. The shares of each of the seven electricity types are applied to total electricity rows to estimate the supply of seven different sources. Because there are some issues like there is no electricity imports except in hydro sector, few of the columns are adjusted pro rata.

Figure 2: Extension of Electricity Sector into ELC, ELG, ELN, ELH, ELS, ELW, ELO Sector

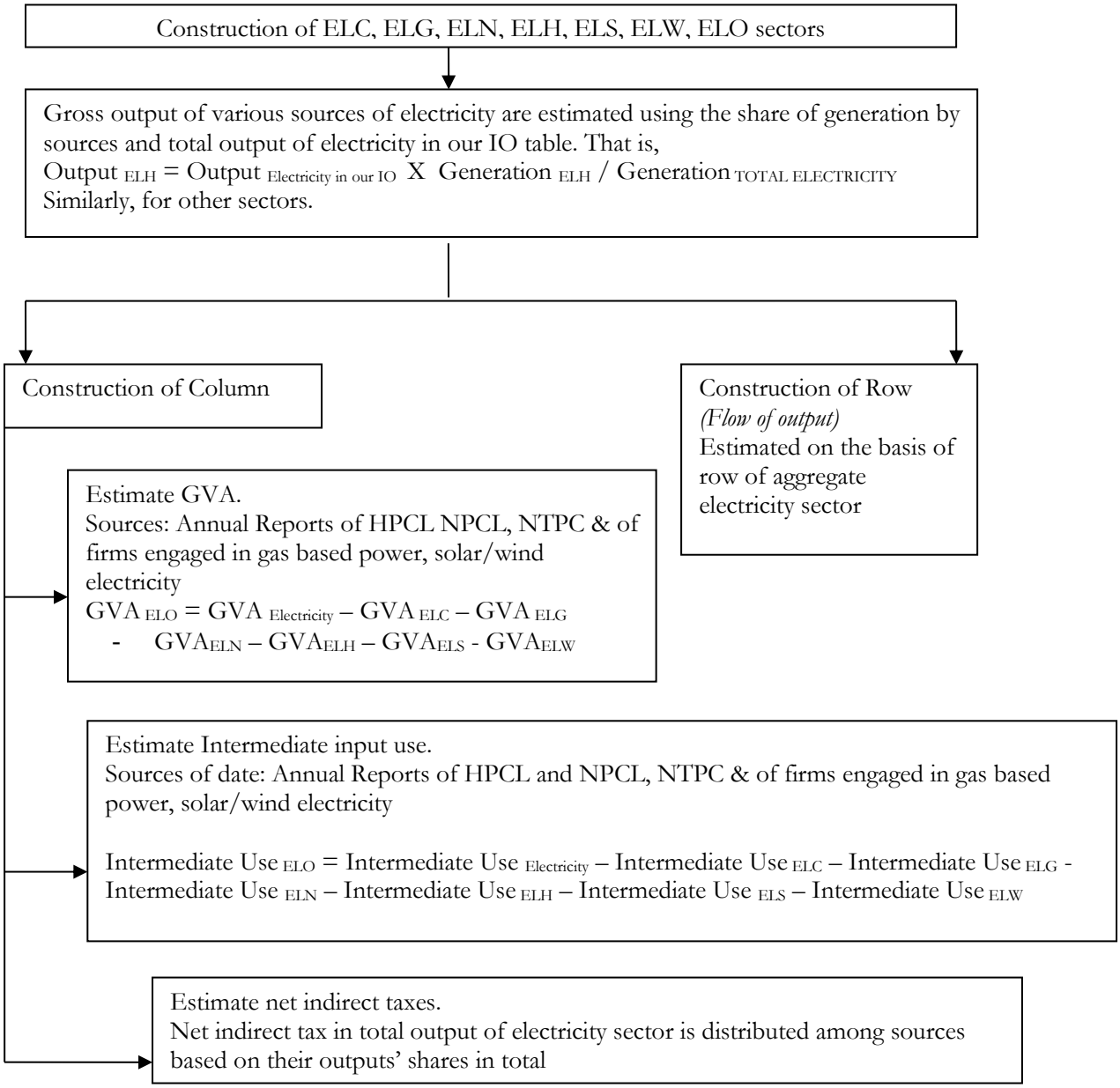
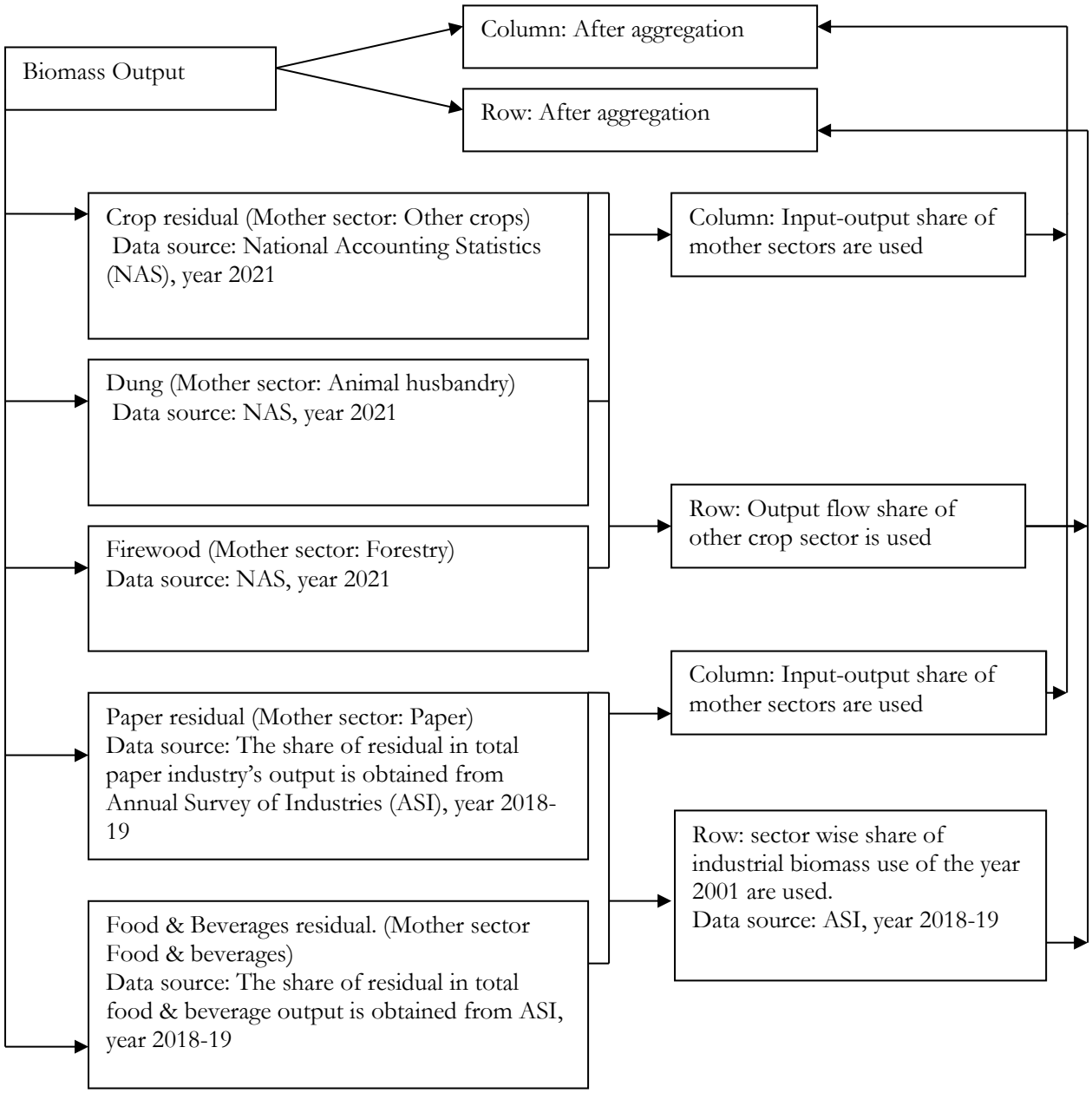


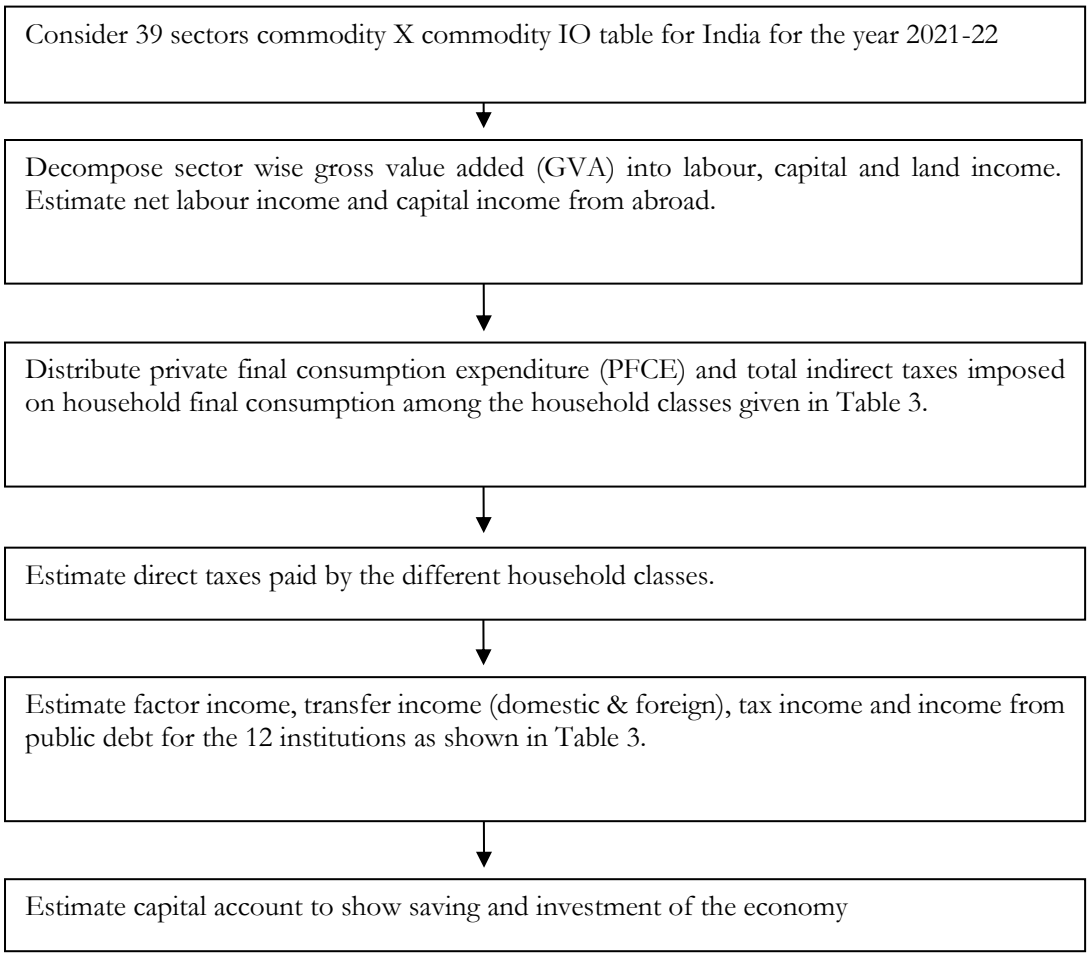
Figure 3: Extension of Sector Commodity–by-commodity IO Table with Biomass



2.2.3. Construction of Sectors other than Production Account in SAM

Apart from information from IO table, SAM requires information for Factors of Production, Households, Private Corporate, Public Non-Departmental enterprises, Government, Indirect Taxes, Capital Account and Rest of the World (ROW). The method that was applied in estimating these sectors in SAM follows the estimation process applied by Pradhan et al (2006). The flowchart in Figure 4 shows the additional path adopted by us for construction these other sectors of the SAM apart from the IO table. In the subsequent sections, we have discussed each step in the flowchart in detail.

Figure 4: Construction Procedure of SAM



*2.2.4. **Division of GVA into Land, Wage and Capital Income***

The Use Table in SUT shows the components of gross value added (GVA) by industry. The components are net production taxes, compensation of employees and gross operating surplus/mixed income. For the sectors that are expanded, we split the value added for the initial industry into the new industries by multiplying the initial value added with the share.

The extension exercise of IO to SAM involves additional data which are mainly drawn from NAS of government of India, RBI's KLEM database and GTAP database. The original data provided to GTAP that was later utilised to prepare GTAP data version 11 is used in this study. In doing so, we have used the following 3 identities:

Gross Value Added (GVA) = Net Value Added (NVA) + Depreciation (1)

NVA = Payment for wage + Payment for land + Net payment for capital other than land (2)

Net payment for capital excluding land =

Gross payment for capital excluding land - Depreciation (3)

We have decomposed GVA into payment for wage, payment for land (if applicable) and the payment for capital (other than land). The following procedure has been used apart from the above identities:

- ASI gives the estimates of total emoluments and GVA from the registered sector for the manufacturing sector. In case of unregistered sector, we could not get similar data. The ratios of registered sector are used for unregistered sector also to get the wage and capital income.
- For agricultural sectors, we have used information from Cost of Cultivation of Principal Crops studies (CCS) of Ministry of Statistics and Programme Implementation (MOSPI) to divide the GVA into land, wage and capital income for agriculture related sectors. CCS give the data of the wages to the hired labour as well as cost of the family labour. The wage estimates given in the SAM are, therefore, inclusive of the wages of the family labour.
- For service sector, we have mainly used KLEM database and NAS statistics to decompose value added into labour and capital income.
- For electricity sectors, we have depended on annual reports of NPCL, HPCL, NTPC, selected firms engaged in solar, wind, and gas-based power station to decomposed value added into labour and capital component.).

2.2.5. Distribution of Sector-wise Consumption Expenditure by Household Classes

The updated IO table provides commodity-wise private final consumption expenditure (PFCE) for 39 sectors only. Therefore, we have to decompose PFCE for these 39 sectors into 10 household classes. The latest round of NSSO survey on consumption expenditure provides distribution of per-capita consumption expenditure for 10 household classes for a more detailed level of classification of commodities for the year 2011-12. Census also gives the distribution of the rural (urban) population for the year of our SAM. These two figures are used to derive consumption expenditure for our household class after (1) adjustment for sector-wise inflation, (2) population growth of rural and urban households.

2.2.6. Distribution of Household Income by Source of Income and by Wage and other Components

We need to estimate total personal incomes of each of our 10 household classes. The households receive income from different sources like labour income, income from capital owned by households, land income, and transfer income from government and rest of the world (ROW). In the first part of this section we have estimated payment for wage for each of the domestic sectors of our SAM. On the other hand, the net wage income from ROW is available from NAS. We have added up these wages payments to obtain households total labour income. Now, we have to distribute this labour income among the 10 household classes. This has been done using (a) information from national household surveys and (b) SAM for the year 2017-18 constructed by Pal, Pradesha and Thurlow (2020).

To estimate household income from capital ownership we have use our estimated data on payments of the domestic production sectors for the capital use. The

payment for capital along with net capital income from ROW is treated as gross capital income of the economy where the data on net capital income from ROW is available from NAS. We subtract depreciation from gross capital income to obtain net capital income of the economy. This net capital income is received by household classes as well as by economic agents like private corporate sector, public non-departmental enterprises, and government. The private corporate sector receives capital income in the form of operating profits while the public non-departmental enterprises receives the same in the form of operating surplus and the government receives capital income in the form of entrepreneurship income. The data on operating surplus, operating profit and income from entrepreneurship are available from NAS for the year 2021-22. So, the remaining part of the capital income is capital income of the households. We have distributed this capital income among the household classes by using the share of each household's capital income as available from SAM of Pal, Pradesha and Thurlow (2020).

Next, we have to estimate land income received by the household classes. The point to be noted is that only rural agricultural self-employed household class receives income from land. In this case, we have taken total payment for land factor as the total land income of that class.

The other sources of household incomes are transfer income from government and net current transfer from ROW. The NAS gives data on current transfer from government and net current transfer from ROW. The government transfer includes direct government transfer to the households and interest payment for debt. A part of this interest payment goes to the private corporate sectors due to their holding of public shares, bonds etc. We have estimated interest income received by the private corporate sector using data from NAS. Now, the remaining part of government transfer is distributed among the household classes using the information drawn from national surveys.

Thus, we have obtained households' personal income from different sources. The household personal income obtained in the above way did not match with the column total of each of the household classes of our SAM. A pro-rata adjustment has been made to obtain the control total i.e. row total of each household classes in our SAM.

2.2.7. Construction of Tax Account (Direct and Indirect taxes)

The indirect taxes reported in our SAM are net of subsidies (net indirect taxes). The net indirect taxes on household consumption and government consumption include sale taxes, excise on domestic production, and custom duties on imported goods. The decomposition of net indirect taxes across production sectors is done using the IO flow table.

The total direct taxes drawn from NAS are distributed among different categories of households in the following manner. Land revenue is paid by self-employed agricultural households. The other direct taxes are distributed among different categories of households in proportion to their personal income, assuming no direct tax to be paid by agricultural and non-agricultural labour households and self-employed rural agricultural households.

2.2.8. Construction of Capital Account

This account represents the macro balancing of savings and investments. Net savings include those by the households, the private corporate sector, the public non-departmental enterprises, the government and ROW. Net savings along with the depreciation equal gross domestic capital formation. The savings of different categories of households are derived by subtracting their consumption and direct taxes from their total personal income.

The retained earnings of the private corporate sector and non-departmental public enterprises are treated as their savings. The difference between the revenue and current expenditure of the government is its saving. The foreign savings is equal to the difference between gross domestic capital formation and gross domestic saving.

2.2.9. Treatment of Foreign Trade, Private Corporate and Public Enterprises

The column of ROW describes the exports of goods and services, net factor income from abroad, net capital transfer to the government, other current transfer to the households and private corporate and foreign savings. The data on exports are directly available from IO flow Table 2021-22. The other data are drawn from NAS and Reserve Bank of India (RBI). We put these data under the column of ROW in such a manner that the column total of ROW must be equal to the total imports.

In our study, government, capital account and Rest of the World (RoW) is treated as an exogenous sector. There are many studies where rest of the world, government and capital accounts are considered as exogenous sector. For example, Njoya (2023) mentioned that exogenous accounts comprise the rest of the world, government and capital accounts. Tiku et al. 2022 considers five exogenous accounts including government, capital balance, indirect tax minus subsidy, rest of Indonesia, and rest of the world. Ferrari et al. (2022) selected public and private expenditure, capital accounts, and Rest of the World (RoW) as exogenous account. Betho et al. (2022) defines exogenous final demand by households, government, investors and exports demand. Mardones & Brevis (2021) stated that exogenous accounts are commonly related to government spending, investment, and/or exports. Morrissey et al. (2019) aggregated Savings and investment and Rest of the World account into a single exogenous account. Hartonoa & Resosudarmo (2008) also considers 'Other' as exogenous account, which consists of corporate, government, capital account, indirect tax, subsidies and foreign transaction accounts. In the method described above, we have constructed a SAM for India for the year 2021-22 (see Appendix III in Supplementary file). This SAM consists of 39 producing sectors, 3 factors of production, and 4 economic institutions including household sector. The households are also classified into 10 broad categories according to their income quintile class in rural and urban area in this SAM. Having filled up the entries in this way, RAS technique is applied so that row total of each row matches the corresponding column total of each column. In this way, consistent SAM of India is estimated.

2.2.10. Estimation of SAM Multiplier

Given this structure of the Indian economy, let us now discuss the impact on factor demand and energy use due to any exogenous change in the Indian economy. This is done using the methodology of SAM multiplier analysis.

Let A be the domestic expenditure coefficient matrix and X be the matrix of sector-wise gross output. Also, let Y_{exo} be the exogenous account comprising government, capital account and Rest of the World. Therefore, the SAM can be written as,

$$X = AX + Y_{exo} \quad (1)$$

$$\text{Or} \quad X = (I - A)^{-1} Y_{exo} \quad (2)$$

If we denote $(I-A)^{-1}$ matrix as M, then equation (2) can be written as

$$X = MY_{exo}, \quad (3)$$

where M is the SAM multiplier matrix, with a representative element m_{ij} as total (direct + indirect + induced) impact on account *i* due to change in exogenous injections in account *j*.

To analyse the effect of change in exogenous sector on labour demand, we need to estimate employment multiplier. For that, first, we need to estimate employment coefficient e_j of sector *j*, which is the ratio of number of jobs E_j to the output X_j (Equation 4). Total effect on employment as a result of change in exogenous account is estimated by Equation 5. Employment multiplier, which captures the effect of change in exogenous sector on labour demand, is estimated as $M(I-A)^{-1}$.

$$e_j = \frac{E_j}{X_j} \quad (4)$$

$$T = M(I - A)^{-1} Y \quad (5)$$

SAM multiplier has several applications. For instance, to capture the impact on production activities due to increased spending by the household, one needs to consider the column of the household sector corresponding to the rows of the activity sectors of M matrix (i.e. $M_{\text{activity by households}}$). Similarly, to understand the impact of increased production activities on household, we need to look at the column of activity sectors corresponding to the rows of the household sector of matrix M, (i.e. $M_{\text{households by activity}}$). Each variation unit in the exogenous account (Y_{exo}) affects the endogenous account (X) by M. The accounting multiplier matrix in the SAM framework captures the overall impacts of the variations in a particular sector, along with other sectors within the economy.

3. Results and Discussion

The focus of the paper is to generate a SAM for India for the year 2021-22. The SAM we generated is a 59×59 matrix, where there are 30 production sectors; 3 factors of production, viz. skilled labour, unskilled labour, capital; direct and commodity tax; 10 categories of households (rural and urban- each with 5 decile groups); government; public non-departmental enterprises; and private corporations. At the first step, a 39-

sector input-output table for India for the year 2021-22 is prepared, and then it is extended to SAM, following the methodology described above. Both the tables are shared as Appendix Table II and III in Supplementary Material, because of space constraint. The SAM helps us to analyse the structure of the economy, employment implication and the consequences of India's energy policy targets on employment generation.

3.1. Structure of the Indian Economy: Some Observations from SAM

The structure of Indian economy can be outlined from the SAM. Table 5 shows that the service sector is fuelling the growth in Indian Economy in 2021-22. In broad classification, the service sector, including transport has highest contribution to the GDP with 51% share while manufacturing sector's contribution (including construction) is at 26%, agriculture at 20% and energy at 4%.

Table 5: Sectoral Share of GDP in total GDP of the year 2021-22 (Unit: Rs Crore)

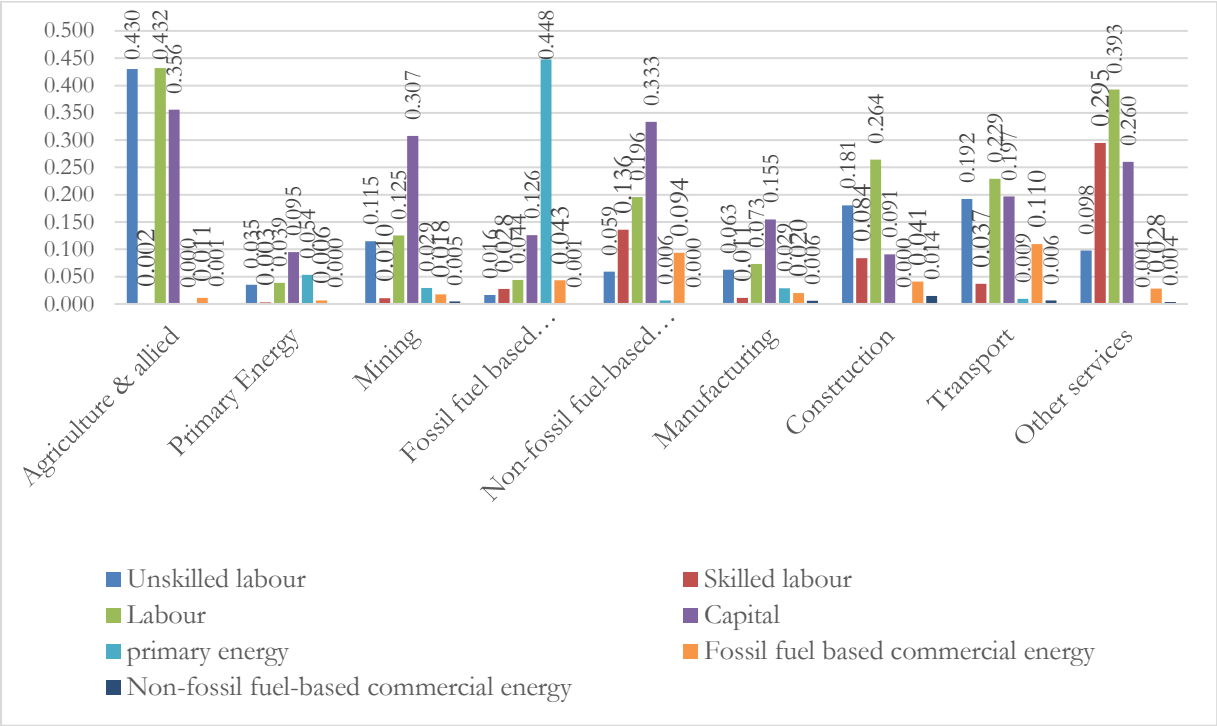
	GDP at basic prices (Rs. Crore)	**Sector wise share**
Agriculture & allied	4106298	18.0%
Primary Energy	272561	1.2%
Mining	218757	1.0%
Commercial energy from fossil fuel	495426	2.2%
Commercial energy from non-fossil fuel	159687	0.7%
Manufacturing	3935392	17.2%
Construction	1928710	8.5%
Transport	1089319	4.8%
Other services	10618273	46.5%
Total	22824423	100.0%

Source: Authors' estimate.

Figure 5 shows that labour intensity is still quite high in agriculture and allied sector, because still agriculture provides subsistence job to Indian population. But largely, the labour intake happens for unskilled workers. Skilled labour intensity is high for services sector and non-fossil fuel-based commercial energy.

Indian economic structure with service sector bias positions the economy in an advantageous position in the current climate change debate. Because of relatively low energy intensity of service sector from production side or supply side, Indian economy enjoys the benefit of relatively low energy intensity. Over all, the energy intensity of Indian economy is 0.073. Here, we want to mention that capital estimates include land, so is capital intensity estimates.

Figure 5 Labour, Capital and Energy Intensity



Source: Authors' estimates.

Our SAM indicates that the households belonging to lowest income quintile in rural areas spend major part (i.e. 33%) of their consumption expenditure on agriculture commodities as compared to other commodities, while the lowest quintile group in urban areas spends only 28% of their consumption expenditure on agriculture commodities. The lowest quintile in rural areas is spending 40% of their consumption expenditure on manufacturing goods, which might be caused by the advent of mobile and other consumption goods which are now perceived as a necessary commodity. On the contrary, the highest income quintile in urban areas spends only 9% of their consumption expenditure on agriculture commodities while spends 65% of their consumption expenditure on services. Both for rural and urban areas, as income grows, people tend to spend less on agriculture commodities and more on services.

3.2. Employment Implications Towards Energy Sector

In this study we have estimated SAM multiplier for some broad sectors, namely agriculture, energy, manufacturing, transport and other services. The results are shown in Table 6. Output multiplier shows how much a sector's output would increase if there is an exogenous shock of unit in the economy. The addition of the columns of the multiplier matrix shows the output multiplier, which reveals the total effect of an exogenous shock received by an endogenous account on the rest of economic activity (Cardenete & Garcia-Tapial 2019). Results show that for one unit change in exogenous sector, output in agriculture and allied activities increase by 6.656 units. Similarly, the effect of increase in 1 unit exogenous account would increase the output of Commercial energy from fossil fuel by 4.132 units, while similar change in exogenous account would increase output of Commercial energy from non-fossil fuel by 6.327 units. For labour demand, 1 unit of increase in exogenous account would increase the labour demand in

Commercial energy from fossil fuel by 2.9 units, while similar change in exogenous account would increase labour demand in commercial energy from non-fossil fuel by 7.0 units. So, our results show that multiplier effect on electricity generation from non-fossil fuel energy sources has larger effect on output and labour demand as compared to electricity generation from fossil fuel energy sources. Agriculture has the highest output multiplier followed by services, construction, transport, Commercial energy from non-fossil fuel and manufacturing. The labour demand multiplier is highest in the case of agriculture. The other sectors contributing to high returns to labour are construction, services and transport.

Table 6: SAM Multiplier for Broad Sector

	Output Multiplier	**Labour Demand Multiplier**
Agriculture & allied	6.656	271.0
Primary Energy	2.355	0.6
Mining	5.253	11.4
Commercial energy from fossil fuel	4.132	2.9
Commercial energy from non-fossil fuel	6.327	7.0
Manufacturing	5.367	18.5
Construction	6.453	75.3
Transport	6.332	47.1
Other services	6.440	47.9

Source: Authors' estimates.

3.3. Implication of India's Environmental Policy Target

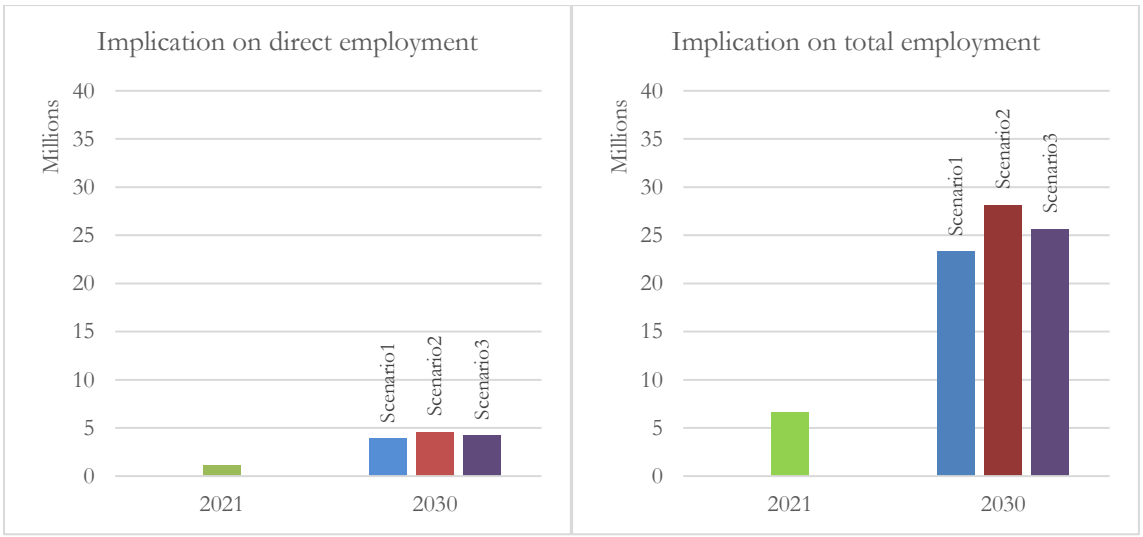
As an application of the newly constructed SAM, we have analysed the employment implication of India's Nationally Determined Contribution (NDC) emission commitments. India first submitted its Intended Nationally Determined Contribution (NDC) to UNFCCC in 2015, with two quantitative targets which are: to make cumulative electric power installed capacity from non-fossil sources 40% by 2030, to reduce the emission intensity of GDP by 33 to 35 percent compared to 2005 levels and making the carbon sink of 2.5 to 3 billion tonnes of CO2 equivalent with forest and tree cover. In the updated Nationally Determined Contribution (NDC) to be communicated to the United Nations Framework Convention on Climate Change (UNFCCC) in 2022, India sets its target to reduce Emissions Intensity of its GDP by 45 percent by 2030, from 2005 level and to reach about 50 percent cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030. Achieving this target requires a shift in technology, which would have implication on the overall economy. Presently the share of renewables in power generation in India is only 12% (as of February 2023). Coal is still the dominant source of energy for power generation (73% in 2023) in India. With increased focus on promotion of renewable energy and policy initiatives to achieve the net zero target, the energy sector is going through a transition phase, and there would be impact of the transition on the socio-economic factors like employment. In this section, we want to explore the impact of the targets on electricity generation from

renewable energy sources on Indian economy, as an application of our SAM along with the Periodic Labour Force Survey data on labour force participation and data on energy sector from India Climate & Energy Dashboard published by NITI Aayog.

We have developed three scenarios for the analysis. (1) Scenario 1 assumes the present composition of energy generation in 2030. (2) Scenario 2 assumes that renewable's share in electricity generation is increased to 50% in 2030. (3) India targets to ramp up the share of installed capacity of electricity generation from renewables to 50% of total installed capacity by 2030, but installation does not always translate into generation, so in Scenario 3, we assumed that renewable's share in electricity generation would become 30% in 2030. All the scenarios are based on 6% growth rate of energy demand, which is the average growth rate of energy generation between 2018-19 to 2022-23.

Our estimates show that the present composition of energy generation (Scenario 1) would provide direct employment to 3.9 million people in 2030, vis-à-vis employment of 1.1 million people in energy sector in 2021 (Figure 6). If renewable's share in electricity generation is increased to 50% (Scenario 2), it would provide direct employment to 4.5 million people in 2030. Under Scenario 3, direct employment is provided to 4.5 million people in 2030 in energy sector.

Figure 6: Implication of India's Renewable Energy Policy Emphasis on Employment



Source: Authors' estimates.

Energy sector is linked with other sectors of the economy through forward and backward linkage, which is captured by the Social Accounting Matrix in our study. So, the impact of employment generation through the environmental policy interventions is not limited to the energy sector only. It generates employment in the sectors which provide input to the electricity generation sector and also generates employment in all sectors through the income effect that it generates in the process. Capturing these two effects, other than direct employment generation, we can see that energy sector, in total, provides employment to 6.6 million people in India in 2021. With present composition

of electricity generation, under Scenario 1, energy sector would provide employment to a total of 23.3 million people, directly or indirectly, in 2030. Under both Scenario 1 and Scenario 2, employment generation is higher as compared to Scenario 1 in 2030. Under Scenario 2, 28.1 million of total employment, and under Scenario 3, 25.7 million of total employment are provided through the interlinkage of other sectors with energy sector. This shows that India's emphasis towards renewable energy sector would not only be beneficial for employment generation in energy sector, but also it generates employment in other sectors too.

4. Concluding Remarks

SAM as a policy tool has wide applications for macro-economic analysis, and thus, the matrix is generated and utilised for designing policies in many countries. SAMs of Indian economy generated so far are mostly based on Input-Output table in the past and none have tried to disaggregate the energy sector to apprehend renewable energy sectors. In view of the importance of the analysis of renewable and non-renewable energy sectors in a growing developing economy like India, such disaggregation is very important for policy design and implementation. Also, Government of India currently publishes Supply-Use table instead of Input-Output table. This paper provides a detailed narrative of the methodology of construction of Input-Output table, and, subsequently construction of a SAM, which is not lucidly covered in literature. Both the tables, which capture structural aspects of the economy, can be utilised for several environmental policy related research. Capturing the methodological nuisances using a large set of databases for India and highlighting the usefulness of such framework in energy and environmental policy analysis have been the two motivating factors for the research.

The SAM highlights the income distribution across the occupational classes, which has an important role as an information system. The SAM not only talks about the structure of the economy, it indicates the spending pattern of the households across rural and urban income decile groups.

SAM multiplier provides a useful tool to understand the different linkages in the economy. Our analysis indicates that the labour demand multiplier is higher for agriculture and services sector, but the magnitudes differ because agriculture still absorbs majority of the unskilled labour force. Nonetheless, these two sectors will play a key role in employment generation for the Indian economy. This is particular of importance since inclusive growth is the focus of the policy-makers at present.

To illustrate the use of SAM, we have also assessed the impact of India's environmental policy initiatives in the context of employment generation. Our results show that India's policy emphasis on greater reliance on renewable energy sources for power generation would not only generate jobs in the electricity generation sector, but also would increase overall employment as compared to the present composition of electricity generation sources.

Although SAM has significantly extended the multi-sectoral framework of the IO table, it still falls short in representing elements such as pollutants, environmental quality, natural resources, and their interactions with economic activities. In future, we want to work along this line.

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Appendix I.ii: Description of 140 Products in Supply-Use table 2018-19

S. No.	Products	S. No.	Products	S. No.	Products
1	Paddy	48	Sugar	95	Electrical industrial machinery
2	Wheat	49	Bread & Bakery products	96	Electrical cables, wires
3	Coarse cereals	50	Miscellaneous food products	97	Batteries
4	Gram	51	Alcoholic beverages	98	Electrical appliances
5	Arhar	52	Non-alcoholic beverages	99	Communication equipment
6	Other pulses	53	Tea processed	100	Other electrical machinery
7	Groundnut	54	Coffee processed	101	Electronic equipment including T.V.
8	Rapeseed and mustard	55	Tobacco Products	102	Medical precision, optical instrument
9	Other oil seeds	56	Cotton Yarn and Cotton Textiles	103	Watches and clocks
10	kapas	57	Synthetic yarn and synthetic textiles	104	Ships and boats
11	jute, hemp and mesta	58	Wool yarn and woolen textiles	105	Rail equipment
12	Sugarcane	59	Silk yarn and silk textiles	106	Motor vehicles
13	Coconut	60	Carpet weaving	107	Motor cycles and scooters
14	Tobacco	61	Readymade garments	108	Bicycles, cycle-rickshaw
15	Tea	62	Misc. textile products	109	Aircrafts & Spacecrafts
16	Coffee	63	Leather footwear	110	Other transport equipment
17	Rubber	64	Leather and leather products except footwear	111	Gems & jewellery
18	Fruits	65	Wood and wood products except furniture	112	Miscellaneous manufacturing
19	Vegetables	66	Paper, Paper products and newsprint	113	Construction and construction services
20	Other food crops	67	Publishing, printing and allied activities	114	Electricity
21	Milk	68	Furniture & Fixtures	115	Gas
22	Wool	69	Rubber products	116	Water Supply
23	Egg and poultry	70	Plastic products	117	Trade
24	Other livestock products	71	Petroleum products	118	Repair & Maintenance of Motor Vehicle
25	Industry Wood	72	Coal tar products	119	Hotels & Restaurant
26	Firewood	73	Inorganic chemicals	120	Railway Transport
27	Other forestry products	74	Organic chemicals	121	Land transport

28	Inland Fish	75	Fertilizers	122	Air transport
29	Marine Fish	76	Pesticides	123	Water Transport
30	Coal and Lignite	77	Paints, varnishes and lacquers	124	Supportive and Auxiliary transport activities
31	Natural Gas	78	Drugs and medicine	125	Storage and warehousing
32	Crude petroleum	79	Soaps, cosmetics and glycerine	126	Communication services
33	Iron ore	80	Synthetic fibres, resin	127	Financial services
34	Manganese ore	81	Other chemicals and chemical products	128	Insurance services
35	Bauxite	82	Cement	129	Ownership of dwellings
36	Copper ore	83	Non-metallic mineral products	130	Real estate services
37	Other Metallic minerals	84	Iron and steel Ferro alloys	131	Renting of machinery & equipment
38	Limestone	85	Iron and steel casting and forging	132	Research & Development Services
39	Mica	86	Iron and steel foundries	133	Legal services
40	Other non-metallic minerals	87	Non-ferrous basic metals (including alloys)	134	Other Business services
41	Processed poultry meat & poultry meat products	88	Hand tools, hardware	135	Computer related services
42	Processed other meat & meat products	89	Miscellaneous metal products	136	Public administration and defence
43	Processed fish & fish products	90	Tractors and other agricultural implements	137	Education services
44	Processed fruits & Processed Vegetables	91	Industrial machinery for food and textile industry	138	Human health and social care services
45	Dairy products	92	Industrial machinery (except food and textile)	139	Community, social and personal services
46	Edible Oils and Fats	93	Machine tools	140	Recreation, entertainment and radio & TV broadcasting and other services
47	Grain Mill products, starch and starch products	94	Other non-electrical machinery		

Appendix I.ii: Description of 66 Products in Supply-Use table 2018-19

S. No.	Sector	S. No.	Sector	S. No.	Sector
1	Agriculture	23	Manufacture of electronic component, consumer electronics, magnetic and optical media	45	Railway Transport
2	Livestock	24	Manufacture of computer and peripheral equipment	46	Land Transport
3	Forestry and Logging	25	Manufacture of communication equipments	47	Water Transport
4	Fishing & Aquaculture	26	Manufacture of optical and electronics products n.e.c.	48	Air Transport
5	Coal & Lignite	27	Manufacture of Electrical equipments	49	Supportive & Auxiliary transport activities
6	Crude Petroleum	28	Manufacture of machinery and equipments n.e.c.	50	Storage & warehousing
7	Natural Gas	29	Manufacture of Transport	51	Communication
8	Iron Ore	30	Manufacture of coke and refined petroleum products	52	Trade
9	Non-ferrous metal ores	31	Manufacture of chemical and chemical products except pharmaceuticals, medicinal and botanical products	53	Hotels & Restaurant
10	Other Mining	32	Manufacture of pharmaceutical; medicinal chemicals and botanical products	54	Financial Services
11	Production, processing and preservation of meat, fish, fruit, vegetables, oils and fats	33	Manufacture of rubber & plastic products	55	Insurance Services
12	Manufacture of dairy products	34	Manufacture of other non-metallic mineral products	56	Ownership of dwellings
13	Manufacture of grain mill products, etc. and animal feeds	35	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting material	57	Education & Research
14	Manufacture of other food products	36	Manufacture of paper and paper products	58	Medical and Health
15	Manufacture of beverages	37	Printing and reproduction of recorded media except publishing	59	Legal Services

16	Manufacture of tobacco products	38	Manufacture of furniture	60	Computer related services
17	Manufacture of textiles + cotton ginning	39	Other Manufacturing	61	Other Business services
18	Manufacture of wearing apparel, except custom tailoring	40	Repair and installation of machinery and equipments	62	Real estate activities
19	Manufacture of leather and related products	41	Construction	63	Renting of machinery and equipment
20	Manufacture of Basic Iron and Steel + Casting of iron and steel	42	Electricity	64	Community, Social & personal services
21	Manufacture of basic precious and non-ferrous metals + Casting of non-ferrous metals	43	Gas	65	Other services
22	Manufacture of fabricated metal products, except machinery and equipments	44	Water supply	66	Public administration. & defence

Appendix II: The Input-Output Matrix of India – 2021-22 (Unit Rs Crore)

	AGR	FSH	LIV	FRS	BIO	COL	OIL	NGS	MIN	TXL	PPR	PET	CEM	FRM
AGR	78508	104	186889	0	18973	1	0	1	936	104006	699	0	66	460
FSH	0	4989	0	0	621	0	0	0	0	2	0	0	0	0
LIV	0	10552	9780	0	2688	0	0	0	45	3054	0	0	0	0
FRS	0	0	18163	626	1297	0	1	0	38	51	18588	25	256	54
BIO	0	0	0	0	8948	16	8	11	89	6605	1210	14	63	553
COL	0	0	0	0	43	109	736	182	3633	11654	4625	14304	24202	151590
OIL	0	0	0	0	0	6803	52633	13019	5609	28	0	1022356	104	0
NGS	0	4	0	66	4	1060	1045	26979	4806	1410	93	17741	45	331
MIN	0	0	0	0	0	0	131	0	5012	1821	909	0	35624	103724
TXL	0	88	0	1178	82	16	73	19	365	327337	251	1413	250	250
PPR	0	0	0	721	60	730	25	1557	388	1171	11	479	485	16
PET	33596	508	0	5602	2582	2735	940	7592	2767	2408	106	18128	3983	24646
CEM	0	0	0	0	0	1	0	12	3030	202	31	0	21552	304
FRM	0	0	0	0	0	0	151	21090	375	66	130	0	2671	390951
ALM	0	0	0	8	1	0	0	0	57	166	292	0	408	5616
NFM	0	0	0	21	2	0	0	0	142	410	720	0	1007	13853
FER	19513	121	4289	0	1446	99	243	37	2939	37495	3304	2844	3174	1534
CHM	77266	500	16467	393	5994	574	998	675	11475	144112	12690	12188	12465	7617
MAN	33509	13133	27178	27103	7775	7103	5635	9882	26392	80487	56781	10277	29633	67569
CON	0	1998	162	1262	212	4970	3274	6408	44136	57749	10607	5039	12418	29512
ELN	654	0	0	2	39	33	13	4	255	1702	251	169	661	2334
ELS	1019	0	0	3	62	52	21	6	398	2655	391	264	1031	3640
ELW	952	0	0	3	58	49	19	6	371	2480	365	247	963	3400

Appendix III: The Input-Output Matrix of India – 2021-22 (Unit Rs Crore) Contd.

	AGR	FSH	LIV	FRS	BIO	COL	OIL	NGS	MIN	TXL	PPR	PET	CEM	FRM
ELH	2104	0	0	7	50	107	43	13	821	5479	807	545	2128	7511
ELG	501	0	0	2	30	26	10	3	196	1306	192	130	507	1791
ELC	14449	3	0	50	102	736	292	90	5636	37628	5544	3744	14616	51589
ELO	1019	0	0	3	62	52	21	6	398	2654	391	264	1031	3639
RLT	1595	633	1911	625	344	1857	661	626	1190	4996	698	6429	860	4787
LNT	8535	1597	10227	3451	3108	4544	2469	2586	5066	28489	3804	38344	6542	27628
WTT	151	16	181	20	69	8	15	35	35	474	66	241	82	454
ART	264	28	316	35	49	14	27	61	61	826	115	420	142	791
AXT	2885	327	3457	655	441	1592	395	828	2249	9037	1262	4599	1556	8659
TRA	40655	4259	48716	5419	8472	2161	4117	9461	9368	127337	17781	64802	21926	122005
STW	0	0	0	24	1	196	0	85	1095	1417	0	0	0	0
COM	0	0	0	245	18	105	0	79	205	0	0	0	0	0
HOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FIN	102423	228	1034	426	4906	1033	2896	4296	3663	33029	8359	16744	11096	20895
WTD	8842	5	0	71	529	1013	143	72	5049	28	0	23	24	0
DWL	0	54	0	1045	67	2192	845	579	4025	5153	128	0	2068	4801
OSV	77661	6125	143	9717	5958	20150	17724	8942	15173	8843	140	10782	526	25523
IIUSE	506103	45271	328914	58785	75092	60140	95604	115245	167489	1053770	151339	1252557	214167	1088027
Net Product Tax	21775	1422	8838	3627	3988	4812	4576	7245	10782	27615	7894	24696	11160	64981
GVA	2148248	271074	1127320	325990	194017	94311	98103	63514	207975	442380	56809	176207	113545	238773
Output	2676126	317767	1465072	388402	273097	159263	198283	186004	386246	1523765	216042	1453460	338872	1391781

Appendix III: The Input-Output Matrix of India – 2021-22 (Unit Rs Crore) Contd.

	ALM	NFM	FER	CHM	MAN	CON	ELN	ELS	ELW	ELH	ELG	ELC	ELO	RLT
AGR	0	0	1144	4394	522334	5273	241	404	421	888	246	5366	405	0
FSH	0	0	28	107	34027	96	0	1	1	1	1	11	1	0
LIV	0	0	35	134	144852	2022	93	139	116	236	107	1976	140	0
FRS	5	13	1637	6286	55937	119559	271	404	337	686	312	5748	407	0
BIO	49	122	295	1133	16635	163	90	90	90	90	90	12600	1573	27
COL	3060	7549	1991	8447	39488	853	300	285	254	778	460	108106	250	292
OIL	0	0	14869	114528	31695	811	0	0	0	0	0	27	0	0
NGS	119	293	3775	15492	7908	490	1	0	0	0	2779	42	0	764
MIN	16940	41791	12494	47978	111633	41087	27	4	4	12	7	1610	19	0
TXL	34	84	3047	11781	50631	7453	94	147	138	303	72	2078	147	1512
PPR	6	15	485	1888	26379	519	143	223	210	461	110	3155	224	1336
PET	981	2419	2893	12128	28139	18377	4015	5448	1134	11265	1679	88259	5466	6360
CEM	5	13	484	1859	27622	260970	500	678	141	1402	334	10987	680	0
FRM	1034	2551	54	206	392519	433932	1376	2144	2017	4433	675	30352	1515	0
ALM	3039	7496	260	998	47430	8741	10	16	15	33	8	232	16	0
NFM	7496	18492	641	2462	117007	21562	25	40	38	83	20	573	39	0
FER	255	629	17556	67576	69845	5176	14	19	4	39	9	308	19	0
CHM	1048	2585	67600	260273	269850	21161	54	73	15	151	36	9470	73	446
MAN	6340	15641	16353	63374	1735812	825223	1928	2928	3201	6347	1002	44521	5372	3487
CON	2477	6110	6392	24830	205196	4976	357	555	523	1149	273	7865	557	14745
ELN	55	137	242	937	3626	8021	14	0	0	0	0	0	0	549
ELS	86	213	377	1461	5656	12509	0	22	0	0	0	0	0	856
ELW	81	199	352	1365	5283	11686	0	0	20	0	0	0	0	800

Appendix II: The Input-Output Matrix of India – 2021-22 (Unit Rs Crore) Contd.

	ALM	NFM	FER	CHM	MAN	CON	ELN	ELS	ELW	ELH	ELG	ELC	ELO	RLT
ELH	178	440	777	3015	11671	25814	0	0	0	45	0	0	0	1767
ELG	43	105	185	719	2782	6153	0	0	0	0	11	0	0	421
ELC	1225	3022	5338	20710	80160	176981	0	0	0	0	0	307	0	14338
ELO	86	213	377	1461	5654	12506	0	0	0	0	0	0	22	856
RLT	281	692	935	3951	24142	24576	99	0	0	0	76	11881	154	103
LNT	1755	4329	6908	28682	137596	64394	539	993	935	2053	413	2178	842	935
WTT	27	66	83	334	2657	1135	8	12	11	25	6	168	12	10
ART	46	114	145	582	3944	1979	13	21	20	43	10	298	21	17
AXT	508	1253	1591	6369	43448	21657	151	236	222	487	116	3338	237	279
TRA	7154	17648	22421	89739	607290	305148	3482	3101	2913	6510	480	32591	4238	2614
STW	0	0	8	31	4308	59	2	5	5	7	5	14	2	0
COM	0	0	0	0	970	0	29	45	43	94	22	644	46	719
HOT	0	0	0	0	0	0	17	27	25	55	13	378	27	1262
FIN	646	1594	9454	37246	178625	63668	1089	1697	1597	3509	835	24028	1703	3744
WTD	0	0	48	186	500	35543	56	87	82	180	43	1231	87	1075
DWL	300	740	4679	17968	21162	858	84	131	123	271	64	1857	132	0
OSV	66	162	6738	26478	33457	330552	1579	2461	3118	5088	1210	32528	924	23643
IIUSE	55425	136730	212690	887107	5107870	2881682	16701	22434	17770	46727	11524	444728	25349	82959
Net Product Tax	2636	6504	8969	36165	281071	191205	861	1288	334	2150	675	27816	967	4229
GVA	10369	25579	94454	372584	1866035	1737505	15262	27472	29721	56769	12985	253048	24863	158289
Output	68430	168812	316113	1295856	7254976	4810392	32825	51194	47825	105645	25183	725591	51180	245477

Appendix II: The Input-Output Matrix of India – 2021-22 (Unit Rs Crore) Contd.

	LNT	WTT	ART	AXT	TRA	STW	COM	HOT	FIN	WTD	DWL	OSV	IIUSE	PFCE
AGR	9582	0	0	0	29524	0	0	53999	0	1710	0	73332	1099906	1473901
FSH	0	0	39	0	3277	0	0	647	0	1	0	10	43859	270268
LIV	0	0	0	0	10020	0	0	109436	0	7	0	85895	381329	1050191
FRS	27389	0	0	0	5703	0	0	0	0	19	0	111	263923	90086
BIO	2900	89	37	45	4622	19	343	8022	230	139	227	10767	78005	185806
COL	0	0	0	0	4848	0	0	0	0	9	0	131	388180	3220
OIL	0	0	0	0	2619	0	0	0	0	0	0	51	1265153	0
NGS	14800	6057	112	55	1295	9	1533	1054	0	1	2	97	110265	105557
MIN	0	0	0	0	15367	0	0	0	0	2	0	244	436442	0
TXL	1172	6669	151	319	27510	811	1072	6	376	17	2899	4290	454135	570023
PPR	3020	3150	108	322	6952	206	58063	0	9694	95	45259	16222	183885	20300
PET	145805	37868	587	29721	168166	2463	24654	922	0	8246	31788	60688	805065	277394
CEM	0	0	0	0	1758	0	0	5	0	5	0	32	332607	4209
FRM	0	0	2	0	19468	0	0	0	0	10274	0	8222	1326207	0
ALM	0	0	0	0	3760	0	0	0	0	1	0	112	78716	0
NFM	0	0	0	0	9276	0	0	0	0	1	0	276	194186	0
FER	0	0	6	0	13666	176	1415	1	0	1020	0	15585	270359	75830
CHM	10225	2656	63	2084	64256	849	7163	69	0	4496	2229	64087	1094425	210560
MAN	89371	11509	4527	5794	223379	2398	44239	54266	29716	4317	29318	176370	3809190	2512493
CON	85194	109	2699	33690	33296	5508	27730	20360	14889	22546	52179	259682	1011635	206268
ELN	922	163	19	18	529	0	45	101	2950	14	416	2370	27247	5578
ELS	1437	254	30	28	826	1	71	158	4600	23	649	3696	42494	8700
ELW	1343	238	28	26	771	0	66	147	4298	21	606	3453	39698	8127

Appendix II: The Input-Output Matrix of India – 2021-22 (Unit Rs Crore) Contd.

	LNT	WTT	ART	AXT	TRA	STW	COM	HOT	FIN	WTD	DWL	OSV	IIUSE	PFCE
ELH	2966	525	62	57	1704	1	146	325	9494	46	1339	7627	87616	20633
ELG	707	125	15	14	406	0	35	77	2263	11	319	1818	20904	4280
ELC	20372	3605	423	391	11704	8	1004	2232	65203	319	9195	52385	603402	122189
ELO	1437	254	30	28	826	1	71	157	4599	23	649	3695	42483	8697
RLT	9807	833	560	2075	6216	564	2896	1892	6930	395	2448	4509	133229	87508
LNT	48090	2892	1339	8885	48859	2469	11555	7639	11680	1635	21956	64343	630285	754530
WTT	186	39	3	25	6078	4	9549	3124	19233	18	1524	47231	93414	30989
ART	324	68	5	1339	687	8	131	215	39	31	116	607	13973	9817
AXT	20149	1965	64	952	9852	2138	1437	2798	11392	347	1279	7906	178114	75529
TRA	50034	10469	846	6589	105887	1161	20247	33176	5947	4833	17903	79857	1928755	773247
STW	4041	1220	0	372	16970	769	72	71	0	0	0	11367	42148	4009
COM	119559	1148	68	30916	12739	24	23213	13038	48958	68	35246	190506	478747	375316
HOT	15321	0	0	0	0	0	23363	1000	50174	0	4289	45871	141821	225653
FIN	57485	2499	5338	23698	62840	163	45502	7479	12774	3754	58718	136099	956811	666757
WTD	15024	4993	572	644	67	10	1357	231	16855	760	2322	24009	121759	38747
DWL	10810	1351	238	383	12378	258	45126	11172	22263	242	25574	76154	275276	2042700
OSV	61580	13818	4412	23689	43077	905	150006	17026	89613	4571	55377	185983	1325469	1498932
IIUSE	831053	114565	22384	172157	991179	20922	502104	350848	444170	70018	403824	1725691	20811115	13818042
Net Product Tax	54450	6676	1487	11649	72695	1418	34676	14330	24216	5006	30550	92238	1117671	378084
GVA	687162	16725	16304	132349	2056476	23818	330650	190221	1175253	100947	2267934	4197845	21438884	
Output	1572665	137965	40174	316155	3120350	46158	867430	555400	1643639	175971	2702308	6015774	43367669	14196126

Appendix II: The Input-Output Matrix of India – 2021-22 (Unit Rs Crore) Contd.

	GFCE	GFCF	CIS	EXP	Imports	TFUSE	Output
AGR	0	0	19291	118172	35142	1576221	2676126
FSH	0	0	1485	2217	63	273908	317767
LIV	0	6248	7974	27492	8162	1083743	1465072
FRS	0	0	23397	11145	148	124479	388402
BIO	0	16234	-6947	0		195092	273097
COL	0	0	2383	1352	235873	-228918	159262
OIL	0	0	68545	0	1135414	-1066870	198283
NGS	0	0	-29818	0	0	75739	186004
MIN	0	0	13734	30457	94388	-50196	386246
TXL	0	0	9154	542792	52338	1069631	1523765
PPR	0	0	3864	41356	33363	32157	216042
PET	0	0	28775	741576	399350	648395	1453460
CEM	0	0	8861	19708	26513	6265	338872
FRM	0	33998	32200	92885	93510	65574	1391781
ALM	0	0	1674	14216	26177	-10286	68430
NFM	0	0	4131	28051	57555	-25374	168812
FER	0	0	7474	72029	109578	45755	316113
CHM	0	0	30710	271389	311228	201432	1295856
MAN	0	2048803	84826	660608	1860942	3445787	7254976
CON	87179	3533143	14567	36761	79161	3798757	4810392
ELN	0	0	0	0	0	5578	32825
ELS	0	0	0	0	0	8700	51194
ELW	0	0	0	0	0	8127	47825

Appendix II: The Input-Output Matrix of India – 2021-22 (Unit Rs Crore) Contd.

	GFCE	GFCF	CIS	EXP	Imports	TFUSE	Output
ELH	0	0	0	0	2603	18030	105645
ELG	0	0	0	0	0	4280	25183
ELC	0	0	0	0	0	122189	725591
ELO	0	0	0	0	0	8697	51180
RLT	0	12957	0	11783	0	112248	245477
LNT	0	69327	0	118523	0	942381	1572665
WTT	0	1229	0	54927	42594	44551	137965
ART	0	2141	0	64531	50287	26202	40175
AXT	0	23437	0	50181	11105	138042	316156
TRA	0	330234	0	88114	0	1191595	3120350
STW	0	0	0	0	0	4009	46157
COM	0	0	0	25819	12451	388683	867430
HOT	0	0	0	187925	0	413578	555399
FIN	0	0	0	67225	47155	686827	1643639
WTD	15466	0	0	0	0	54213	175971
DWL	319209	47511	0	43461	25848	2427032	2702308
OSV	1924111	564562	0	1329248	626548	4690305	6015774
IIUSE	2345964	6689823	326280	4753944	5377497	22556557	43367671
Net Product Tax	12786	313116	30387	180085		43536893	44654563
GVA							
Output	2358750	7002940	356667	4934029	5377497	66093449	

Appendix III: The Social Accounting Matrix of India – 2021-22 (Unit Rs Crore)

	AGR	FSH	LIV	FRS	BIO	COL	OIL	NGS	MIN	TXL	PPR
AGR	78508	104	186889	0	18973	1	0	1	936	64006	699
FSH	0	4989	0	0	621	0	0	0	0	2	0
LIV	0	10552	9780	0	2688	0	0	0	45	3054	0
FRS	0	0	18163	626	1297	0	1	0	38	51	18588
BIO	0	0	0	0	8948	16	8	11	89	6605	1210
COL	0	0	0	0	43	109	736	182	3633	11654	4625
OIL	0	0	0	0	0	6803	52633	13019	5609	28	0
NGS	0	4	0	66	4	1060	1045	26979	4806	1410	93
MIN	0	0	0	0	0	0	131	0	5012	1821	909
TXL	0	88	0	1178	82	16	73	19	365	367337	251
PPR	0	0	0	721	60	730	25	1557	388	1171	11
PET	33596	508	0	5602	2582	2735	940	7592	2767	2408	106
CEM	0	0	0	0	0	1	0	12	3030	202	31
FRM	0	0	0	0	0	0	151	21090	375	66	130
ALM	0	0	0	8	1	0	0	0	57	166	292
NFM	0	0	0	21	2	0	0	0	142	410	720
FER	19513	121	4289	0	1446	99	243	37	2939	37495	3304
CHM	77266	500	16467	393	5994	574	998	675	11475	144112	12690
MAN	33509	13133	27178	27103	7775	7103	5635	9882	26392	80487	56781
CON	0	1998	162	1262	212	4970	3274	6408	44136	57749	10607
ELN	654	0	0	2	39	33	13	4	255	1702	251
ELS	1019	0	0	3	62	52	21	6	398	2655	391
ELW	952	0	0	3	58	49	19	6	371	2480	365
ELH	2104	0	0	7	50	107	43	13	821	5479	807
ELG	501	0	0	2	30	26	10	3	196	1306	192
ELC	14449	3	0	50	102	736	292	90	5636	37628	5544
ELO	1019	0	0	3	62	52	21	6	398	2654	391
RLT	2032	724	2434	724	387	2318	744	783	1612	6294	886
LNT	10870	1827	13026	3998	3492	5670	2777	3233	6859	35891	4829
WTT	193	18	231	23	78	10	17	44	47	597	84
ART	336	32	402	41	55	17	30	77	82	1040	146

Appendix III: The Social Accounting Matrix of India – 2021-22 (Unit Rs Crore) Contd.

	AGR	FSH	LIV	FRS	BIO	COL	OIL	NGS	MIN	TXL	PPR
TRA	40655	4259	48716	5419	8472	2161	4117	9461	9368	127337	17781
STW	0	0	0	24	1	196	0	85	1095	1417	0
COM	0	0	0	245	18	105	0	79	205	0	0
HOT	0	0	0	0	0	0	0	0	0	0	0
FIN	102423	228	1034	426	4906	1033	2896	4296	3663	33029	8359
WTD	8842	5	0	71	529	1013	143	72	5049	28	0
DWL	0	54	0	1045	67	2192	845	579	4025	5153	128
OSV	77661	6125	143	9717	5958	20150	17724	8942	15173	8843	140
UNSK_LAB	1173842	148120	615988	178127	106014	25025	26031	16853	55184	177527	18243
SK_LAB	4283	540	2248	650	387	2277	2369	1534	5021	30878	3173
CAP	970123	122414	509084	147213	87616	67009	69704	45128	147769	233975	35394
COM_TAX	21775	1422	8838	3627	3988	4812	4576	7245	10782	27615	7894
DIR_TAX	0	0	0	0	0	0	0	0	0	0	0
RH1	0	0	0	0	0	0	0	0	0	0	0
RH2	0	0	0	0	0	0	0	0	0	0	0
RH3	0	0	0	0	0	0	0	0	0	0	0
RH4	0	0	0	0	0	0	0	0	0	0	0
RH5	0	0	0	0	0	0	0	0	0	0	0
UR1	0	0	0	0	0	0	0	0	0	0	0
UR2	0	0	0	0	0	0	0	0	0	0	0
UR3	0	0	0	0	0	0	0	0	0	0	0
UR4	0	0	0	0	0	0	0	0	0	0	0
UR5	0	0	0	0	0	0	0	0	0	0	0
ENTERPRISES	0	0	0	0	0	0	0	0	0	0	0
GOVERNMENT	0	0	0	0	0	0	0	0	0	0	0
INVEST	0	0	0	0	0	0	0	0	0	0	0
STOCKS	0	0	0	0	0	0	0	0	0	0	0
ROW	35142	63	8162	148		235873	1135414	0	94388	52338	33363
Total	2711268	317830	1473235	388550	273097	395136	1333698	186004	480634	1576103	249405

Appendix III: The Social Accounting Matrix of India – 2021-22 (Unit Rs Crore) Contd.

	PET	CEM	FRM	ALM	NFM	FER	CHM	MAN	CON	ELN	ELS
AGR	0	66	460	0	0	1144	4394	522334	5273	241	404
FSH	0	0	0	0	0	28	107	34027	96	0	1
LIV	0	0	0	0	0	35	134	144852	2022	93	139
FRS	25	256	54	5	13	1637	6286	55937	119559	271	404
BIO	14	63	553	49	122	295	1133	16635	163	90	90
COL	14304	24202	151590	3060	7549	1991	8447	39488	853	300	285
OIL	1022356	104	0	0	0	14869	114528	31695	811	0	0
NGS	17741	45	331	119	293	3775	15492	7908	490	1	0
MIN	0	35624	103724	16940	41791	12494	47978	111633	41087	27	4
TXL	1413	250	250	34	84	3047	11781	50631	7453	94	147
PPR	479	485	16	6	15	485	1888	26379	519	143	223
PET	18128	3983	24646	981	2419	2893	12128	28139	18377	4015	5448
CEM	0	21552	304	5	13	484	1859	27622	260970	500	678
FRM	0	2671	390951	1034	2551	54	206	392519	433932	1376	2144
ALM	0	408	5616	3039	7496	260	998	47430	8741	10	16
NFM	0	1007	13853	7496	18492	641	2462	117007	21562	25	40
FER	2844	3174	1534	255	629	17556	67576	69845	5176	14	19
CHM	12188	12465	7617	1048	2585	57747	260273	269850	21161	54	73
MAN	10277	29633	67569	6340	15641	16353	63374	1467943	825223	1928	2928
CON	5039	12418	29512	2477	6110	6392	24830	205196	4976	357	555
ELN	169	661	2334	55	137	242	937	3626	8021	14	0
ELS	264	1031	3640	86	213	377	1461	5656	12509	0	22
ELW	247	963	3400	81	199	352	1365	5283	11686	0	0
ELH	545	2128	7511	178	440	777	3015	11671	25814	0	0
ELG	130	507	1791	43	105	185	719	2782	6153	0	0
ELC	3744	14616	51589	1225	3022	5338	20710	80160	176981	0	0
ELO	264	1031	3639	86	213	377	1461	5654	12506	0	0
RLT	7080	1036	6018	348	859	1119	4701	30373	30356	121	0
LNT	42226	7877	34735	2177	5371	8270	34127	173109	79538	662	1221
WTT	266	98	571	33	81	100	397	3343	1402	9	15
ART	463	171	995	58	142	174	692	4961	2444	17	26

Appendix III: The Social Accounting Matrix of India – 2021-22 (Unit Rs Crore) Contd.

	PET	CEM	FRM	ALM	NFM	FER	CHM	MAN	CON	ELN	ELS
TRA	64802	21926	122005	7154	17648	22421	89739	607290	305148	3482	3101
STW	0	0	0	0	0	8	31	4308	59	2	5
COM	0	0	0	0	0	0	0	970	0	29	45
HOT	0	0	0	0	0	0	0	0	0	17	27
FIN	16744	11096	20895	646	1594	9454	37246	178625	63668	1089	1697
WTD	23	24	0	0	0	48	186	500	35543	56	87
DWL	0	2068	4801	300	740	4679	17968	21162	858	84	131
OSV	10782	526	25523	66	162	6738	26478	33457	330552	1579	2461
UNSK_LAB	12398	24079	61047	2651	6540	17460	68890	579944	882820	1714	3086
SK_LAB	3991	4188	10618	461	1137	3037	11982	100872	410054	3929	7072
CAP	159818	85277	167107	7257	17902	73957	291712	1453088	444631	9619	17314
COM_TAX	24696	11160	64981	2636	6504	8969	36165	281071	191205	861	1288
DIR_TAX	0	0	0	0	0	0	0	0	0	0	0
RH1	0	0	0	0	0	0	0	0	0	0	0
RH2	0	0	0	0	0	0	0	0	0	0	0
RH3	0	0	0	0	0	0	0	0	0	0	0
RH4	0	0	0	0	0	0	0	0	0	0	0
RH5	0	0	0	0	0	0	0	0	0	0	0
UR1	0	0	0	0	0	0	0	0	0	0	0
UR2	0	0	0	0	0	0	0	0	0	0	0
UR3	0	0	0	0	0	0	0	0	0	0	0
UR4	0	0	0	0	0	0	0	0	0	0	0
UR5	0	0	0	0	0	0	0	0	0	0	0
ENTERPRISES	0	0	0	0	0	0	0	0	0	0	0
GOVERNMENT	0	0	0	0	0	0	0	0	0	0	0
INVEST	0	0	0	0	0	0	0	0	0	0	0
STOCKS	0	0	0	0	0	0	0	0	0	0	0
ROW	399350	26513	93510	26177	57555	43601	311228	2067510	79161	0	0
Total	1852810	365385	1485290	94607	226367	349861	1607084	9322486	4889553	32825	51194

Appendix III: The Social Accounting Matrix of India – 2021-22 (Unit Rs Crore) Contd.

	ELW	ELH	ELG	ELC	ELO	RLT	LNT	WTT	ART	TRA	STW
AGR	421	888	246	5366	405	0	9582	0	0	29524	0
FSH	1	1	1	11	1	0	0	0	39	3277	0
LIV	116	236	107	1976	140					10020	0
FRS	337	686	312	5748	407	0	27389	0	0	5703	0
BIO	90	90	90	12600	1573	27	2943	90	38	4622	19
COL	254	778	460	108106	250	292	0	0	0	4848	0
OIL	0	0	0	27	0					2619	0
NGS	0	0	2779	42	0	766	14838	6072	113	1295	9
MIN	4	12	7	1610	19					15367	0
TXL	138	303	72	2078	147	1562	1212	6893	156	27510	811
PPR	210	461	110	3155	224	1392	3148	3283	113	6952	206
PET	1134	11265	1679	88259	5466	7352	168538	43772	679	168166	2463
CEM	141	1402	334	10987	680					1758	0
FRM	2017	4433	675	30352	1515	0	0	0	2	19468	0
ALM	15	33	8	232	16					3760	0
NFM	38	83	20	573	39					9276	0
FER	4	39	9	308	19	0	0	0	6	13666	176
CHM	15	151	36	9470	73	515	11816	3069	73	74109	849
MAN	3201	6347	1002	44521	5372	3673	94126	12121	4768	223379	2398
CON	523	1149	273	7865	557	19580	113128	145	3584	33296	5508
ELN	0	0	0	0	0	555	931	165	19	529	0
ELS	0	0	0	0	0	866	1453	257	30	826	1
ELW	20	0	0	0	0	809	1357	240	28	771	0
ELH	0	45	0	0	0	1786	2998	530	62	1704	1
ELG	0	0	11	0	0	426	715	126	15	406	0
ELC	0	0	0	307	0	14483	20578	3641	427	11704	8
ELO	0	0	0	0	22	865	1452	257	30	826	1
RLT	0	0	93	14611	190	149	15126	1417	682	6216	961
LNT	1149	2525	508	2679	1035	1337	73121	4848	1609	48859	4203
WTT	14	30	7	207	15	13	268	62	4	6078	7
ART	24	53	13	366	26	88	1788	412	24	687	13

Appendix III: The Social Accounting Matrix of India – 2021-22 (Unit Rs Crore) Contd.

	ELW	ELH	ELG	ELC	ELO	RLT	LNT	WTT	ART	TRA	STW
TRA	2913	6510	480	32591	4238	2883	55189	10881	933	105887	1161
STW	5	7	5	14	2	0	4326	1306	0	16970	769
COM	43	94	22	644	46	902	142203	1441	85	12739	24
HOT	25	55	13	378	27	1262	15321	0	0	0	0
FIN	1597	3509	835	24028	1703	5029	77210	3356	6972	62840	163
WTD	82	180	43	1231	87	1107	15470	5141	589	67	10
DWL	123	271	64	1857	132	0	11144	1393	245	12378	258
OSV	3118	5088	1210	32528	924	27847	75681	16982	5422	43077	905
UNSK_LAB	3338	6376	1458	28422	2793	82193	356814	8684	8466	553277	10748
SK_LAB	7652	14615	3343	65148	6401	15797	68578	1669	1627	414484	2066
CAP	18731	35778	8183	159478	15670	84147	365296	8891	8667	1088715	11004
COM_TAX	334	2150	675	27816	967	4966	63939	7839	1746	72695	1418
DIR_TAX	0	0	0	0	0	0	0	0	0	0	0
RH1	0	0	0	0	0	0	0	0	0	0	0
RH2	0	0	0	0	0	0	0	0	0	0	0
RH3	0	0	0	0	0	0	0	0	0	0	0
RH4	0	0	0	0	0	0	0	0	0	0	0
RH5	0	0	0	0	0	0	0	0	0	0	0
UR1	0	0	0	0	0	0	0	0	0	0	0
UR2	0	0	0	0	0	0	0	0	0	0	0
UR3	0	0	0	0	0	0	0	0	0	0	0
UR4	0	0	0	0	0	0	0	0	0	0	0
UR5	0	0	0	0	0	0	0	0	0	0	0
ENTERPRISES	0	0	0	0	0	0	0	0	0	0	0
GOVERNMENT	0	0	0	0	0	0	0	0	0	0	0
INVEST	0	0	0	0	0	0	0	0	0	0	0
STOCKS	0	0	0	0	0	0	0	0	0	0	0
ROW	0	2603	0	0	0	0	0	47687	24300	0	0
Total	47825	108248	25183	725591	51180	282669	1817676	202671	71554	3120351	46158

Appendix III: The Social Accounting Matrix of India – 2021-22 (Unit Rs Crore) Contd.

	COM	HOT	FIN	WTD	DWL	OSV	UNSK_LAB	SK_LAB	CAP	COM_TAX	DIR_TAX
AGR	0	53999	0	1710	0	73332	0	0	0	0	0
FSH	0	647	0	1	0	10	0	0	0	0	0
LIV	0	59436	0	7	0	85895	0	0	0	0	0
FRS	0	0	0	19	0	111	0	0	0	0	0
BIO	343	8022	230	139	227	10767	0	0	0	0	0
COL	0	0	0	9	0	131	0	0	0	0	0
OIL	0	0	0	0	0	51	0	0	0	0	0
NGS	1533	1054	0	1	2	97	0	0	0	0	0
MIN	0	0	0	2	0	244	0	0	0	0	0
TXL	1072	6	376	17	2899	4290	0	0	0	0	0
PPR	58063	0	9694	95	45259	16222	0	0	0	0	0
PET	24654	922	0	8246	31788	60688	0	0	0	0	0
CEM	0	5	0	5	0	32	0	0	0	0	0
FRM	0	0	0	10274	0	8222	0	0	0	0	0
ALM	0	0	0	1	0	112	0	0	0	0	0
NFM	0	0	0	1	0	276	0	0	0	0	0
FER	1415	1	0	1020	0	15585	0	0	0	0	0
CHM	7163	69	0	4496	2229	64087	0	0	0	0	0
MAN	44239	104266	29716	4317	29318	176370	0	0	0	0	0
CON	27730	20360	14889	22546	52179	259682	0	0	0	0	0
ELN	45	101	2950	14	416	2370	0	0	0	0	0
ELS	71	158	4600	23	649	3696	0	0	0	0	0
ELW	66	147	4298	21	606	3453	0	0	0	0	0
ELH	146	325	9494	46	1339	7627	0	0	0	0	0
ELG	35	77	2263	11	319	1818	0	0	0	0	0
ELC	1004	2232	65203	319	9195	52385	0	0	0	0	0
ELO	71	157	4599	23	649	3695	0	0	0	0	0
RLT	3068	2304	9014	461	2568	4814	0	0	0	0	0
LNT	12243	9300	15192	1907	23034	68702	0	0	0	0	0
WTT	10118	3803	25017	21	1599	50431	0	0	0	0	0
ART	139	262	50	37	122	648	0	0	0	0	0

Appendix III: The Social Accounting Matrix of India – 2021-22 (Unit Rs Crore) Contd.

	COM	HOT	FIN	WTD	DWL	OSV	UNSK_LAB	SK_LAB	CAP	COM_TAX	DIR_TAX
TRA	20247	33176	5947	4833	17903	79857	0	0	0	0	0
STW	72	71	0	0	0	11367	0	0	0	0	0
COM	23213	13038	48958	68	35246	190506	0	0	0	0	0
HOT	23363	1000	50174	0	4289	45871	0	0	0	0	0
FIN	45502	7479	12774	3754	58718	136099	0	0	0	0	0
WTD	1357	231	16855	760	2322	24009	0	0	0	0	0
DWL	45126	11172	22263	242	25574	76154	0	0	0	0	0
OSV	150006	17026	89613	4571	55377	185983	0	0	0	0	0
UNSK_LAB	160392	54664	92632	11338	225869	441308	0	0	0	0	0
SK_LAB	30827	40952	364325	25989	1224323	2567582	0	0	0	0	0
CAP	139431	94605	718296	63620	817742	1188955	0	0	0	0	0
COM_TAX	34676	14330	24216	5006	30550	92238	0	0	0	0	0
DIR_TAX	0	0	0	0	0	0	0	0	0	0	0
RH1	0	0	0	0	0	0	318473	278824	363117	0	0
RH2	0	0	0	0	0	0	465240	407319	465162	0	0
RH3	0	0	0	0	0	0	550154	481662	515712	0	0
RH4	0	0	0	0	0	0	663903	581250	472060	0	0
RH5	0	0	0	0	0	0	956022	837001	292767	0	0
UR1	0	0	0	0	0	0	33586	29404	7553	0	0
UR2	0	0	0	0	0	0	97701	85538	19861	0	0
UR3	0	0	0	0	0	0	217482	190406	22979	0	0
UR4	0	0	0	0	0	0	531368	465215	49755	0	0
UR5	0	0	0	0	0	0	2426250	2124192	106558	0	0
ENTERPRISES	0	0	0	0	0	0	0	0	6499857	0	0
GOVERNMENT	0	0	0	0	0	0	0	0	606613	2032128	1593949
INVEST	0	0	0	0	0	0	0	0	0	0	0
STOCKS	0	0	0	0	0	0	0	0	0	0	0
ROW	12451	0	47155	0	25848	626548	0	0	0	0	0
Total	879881	555400	1690795	175971	2728156	6642322	6260179	5480813	9421995	2032128	1593949

Appendix III: The Social Accounting Matrix of India – 2021-22 (Unit Rs Crore) Contd.

	RH1	RH2	RH3	RH4	RH5	UR1	UR2	UR3	UR4	UR5	ENT
AGR	187186	239900	287185	234355	193311	10284	32993	37968	78800	211919	0
FSH	24281	32733	35685	39924	42217	2213	5173	10609	20153	57281	0
LIV	63119	121319	208555	191388	188535	6054	15206	31208	72073	202733	0
FRS	20933	19130	17721	14121	6954	1905	2384	2841	2565	1532	0
BIO	25409	35436	36160	39092	34262	6635	3495	1772	1772	1772	0
COL	447	475	382	249	123	217	341	346	382	258	0
OIL	0	0	0	0	0	0	0	0	0	0	0
NGS	0	0	0	0	0	0	0	0	0	105557	0
MIN	0	0	0	0	0	0	0	0	0	0	0
TXL	49274	63834	75222	89334	92474	5169	13102	18690	37283	125641	0
PPR	1669	2149	2474	2658	2677	193	414	828	1866	5371	0
PET	16103	20934	28126	43615	62714	2115	5094	11867	31899	54928	0
CEM	584	621	499	326	161	284	445	452	500	337	0
FRM	0	0	0	0	0	0	0	0	0	0	0
ALM	0	0	0	0	0	0	0	0	0	0	0
NFM	0	0	0	0	0	0	0	0	0	0	0
FER											0
CHM	15137	20272	24409	31010	38628	1908	2793	7708	17166	51528	0
MAN	327912	374559	328679	327401	394516	24969	83827	216194	173007	695867	0
CON	0	0	0	0	0	0	0	0	0	206268	0
ELN	262	433	592	726	742	71	158	327	767	1499	0
ELS	409	675	923	1132	1158	111	246	511	1197	2338	0
ELW	382	631	863	1058	1082	104	230	477	1118	2185	0
ELH	971	1601	2190	2685	2746	263	583	1211	2838	5546	0
ELG	201	332	454	557	570	55	121	251	589	1150	0
ELC	5749	9479	12967	15900	16262	1559	3453	7170	16806	32843	0
ELO	409	675	923	1132	1157	111	246	510	1196	2338	0
RLT	1795	2832	3572	4669	9274	353	1276	2533	8548	58933	0
LNT	39965	66799	90989	120316	140509	4872	11361	26736	67885	259649	0
WTT	3614	6717	4607	4517	7608	83	315	654	709	4151	0
ART	0	5	1	4	368	0	0	0	0	10278	0

Appendix III: The Social Accounting Matrix of India – 2021-22 (Unit Rs Crore) Contd.

	RH1	RH2	RH3	RH4	RH5	UR1	UR2	UR3	UR4	UR5	ENT
TRA	35664	50804	63672	88147	140124	4322	10119	21981	54761	304319	0
STW	0	0	0	0	0	0	0	0	0	4009	0
COM	26344	30482	29881	30551	48975	2492	4360	9146	20122	172963	0
HOT	10496	16605	22579	27891	32935	1495	3481	8011	20099	82059	0
FIN	14339	14436	27856	40912	96953	1701	5824	11144	32239	421352	0
WTD	629	1495	2640	3367	3811	375	938	1988	5157	18347	0
DWL	36132	47453	55518	80248	203146	9176	22376	61374	184754	1342523	0
OSV	69075	98399	123322	170726	271395	8371	19598	42573	106062	589411	0
UNSK_LAB	0	0	0	0	0	0	0	0	0	0	0
SK_LAB	0	0	0	0	0	0	0	0	0	0	0
CAP	0	0	0	0	0	0	0	0	0	0	0
COM_TAX	25376	33294	38675	45915	58166	2926	6223	11906	27584	128019	0
DIR_TAX	0	0	0	0	56066	0	0	0	154642	671204	712037
RH1	0	0	0	0	0	0	0	0	0	0	60341
RH2	0	0	0	0	0	0	0	0	0	0	98785
RH3	0	0	0	0	0	0	0	0	0	0	111074
RH4	0	0	0	0	0	0	0	0	0	0	181162
RH5	0	0	0	0	0	0	0	0	0	0	614777
UR1	0	0	0	0	0	0	0	0	0	0	15608
UR2	0	0	0	0	0	0	0	0	0	0	30125
UR3	0	0	0	0	0	0	0	0	0	0	145117
UR4	0	0	0	0	0	0	0	0	0	0	179049
UR5	0	0	0	0	0	0	0	0	0	0	1754572
ENTERPRISES	0	0	0	0	0	0	0	0	0	0	0
GOVERNMENT	0	0	0	0	0	0	0	0	0	0	0
INVEST	73639	211409	255925	397921	961062	-3913	18928	132241	402812	2169477	2597211
STOCKS	0	0	0	0	0	0	0	0	0	0	0
ROW	4285	5297	5082	5440	7969	699	1542	3028	6129	19419	
Total	1081793	1531215	1788329	2057286	3118650	97174	276642	684254	1553479	8025004	6499857

Appendix III: The Social Accounting Matrix of India – 2021-22 (Unit Rs Crore) Contd.

	GOVERNMENT	INVEST	STOCKS	ROW	Total
AGR	0	0	19291	118172	2711269
FSH	0	0	1485	2217	317830
LIV	0	6248	7974	27492	1473235
FRS	0	0	23397	11145	388550
BIO	0	16234	-6947	0	273097
COL	0	0	2383	1352	395136
OIL	0	0	68545	0	1333697
NGS	0	0	-29818	0	186004
MIN	0	0	13734	30457	480634
TXL	0	0	9154	502792	1576103
PPR	0	0	3864	41356	249405
PET	0	0	28775	741576	1852810
CEM	0	0	8861	19708	365385
FRM	0	33998	32200	92885	1485290
ALM	0	0	1674	14216	94606
NFM	0	0	4131	28051	226367
FER	0	0	7474	72029	349861
CHM	0	0	30710	271389	1607084
MAN	0	2048803	84826	650608	9322487
CON	87179	3533143	14567	36761	4889553
ELN	0	0	0	0	32825
ELS	0	0	0	0	51194
ELW	0	0	0	0	47825
ELH	0	0	0	0	108248
ELG	0	0	0	0	25183
ELC	0	0	0	0	725591
ELO	0	0	0	0	51180
RLT	0	12111	0	14150	282669
LNT	0	92220	0	142336	1817677
WTT	0	1565	0	62783	202671
ART	0	2727	0	41019	71554

Appendix III: The Social Accounting Matrix of India – 2021-22 (Unit Rs Crore) Contd.

	GOVERNMENT	INVEST	STOCKS	ROW	Total
TRA	0	330234	0	88114	3120350
STW	0	0	0	0	46157
COM	0	0	0	33599	879882
HOT	0	0	0	187925	555399
FIN	0	0	0	67422	1690794
WTD	15466	0	0	0	175971
DWL	319209	47511	0	43461	2728156
OSV	1924111	564562	0	1330458	6642322
UNSK_LAB	0	0	0	9823	6260179
SK_LAB	0	0	0	14734	5480813
CAP	0	0	0	-568322	9421995
COM_TAX	12785.7	313116	30387	180085	2032128
DIR_TAX	0	0	0	0	1593949
RH1	44530	0	0	16508	1081793
RH2	71102	0	0	23607	1531215
RH3	99531	0	0	30195	1788329
RH4	124906	0	0	34005	2057286
RH5	336183	0	0	81900	3118650
UR1	9811	0	0	1212	97174
UR2	32552	0	0	10864	276642
UR3	79442	0	0	28828	684254
UR4	237788	0	0	90304	1553479
UR5	1266522	0	0	346910	8025004
ENTERPRISES	0	0	0	0	6499857
GOVERNMENT	0	0	0	-203871	4028819
INVEST	-632297	0	0	-187052	6397363
STOCKS	0	-605109	0	961775	356666
ROW					5544979
Total	4028820	6397363	356667	5544978	116664629

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