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A GENDERED 1993-94 SOCIAL ACCOUNTING MATRIX FOR BANGLADESH

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Abstract

This working paper documents the construction of a 1993-94 Social Accounting Matrix (SAM) for Bangladesh. [1] The SAM distinguishes 10 agricultural sectors—including two different kinds of rice technology—and 19 manufacturing sectors, out of 43 sectors in total. It also differentiates between twelve socio-economic groups, allowing detailed analysis of household welfare and poverty. The SAM has ten factors of production: one type of capital, one type of land and eight different types of labor which are disaggregated by both level of education and gender. The innovative feature of the SAM is that it separates out female and male labor value-added for each educational level and in each sector of the economy, providing a base for gender-sensitive analyses of policy changes. The SAM is estimated with a cross-entropy approach, which makes efficient use of all available data in a framework that incorporates prior information and constraints.

[1] The SAM was built as part of a collaboration between IFPRI and IDS at the University of Sussex, England. Many helpful suggestions by Adrian Wood are gratefully acknowledged.

Table of Contents

List of Abbreviations

BBS	Bangladesh Bureau of Statistics
BIDS	Bangladesh Institute of Development Studies
CGE	Computable General Equilibrium
C.I.F.	Cost, Insurance, Freight
GAMS	General Algebraic Modeling System
GDP (f.c.)	Gross Domestic Product at Factor Costs
GFCF	Gross Fixed Capital Formation
GNP (f.c.)	Gross National Product at Factor Costs
F.O.B.	Free on Board
HES	Household Expenditure Survey
IMF	International Monetary Fund
IO	Input Output
LFS	Labour Force Survey
Macro SAM	Macroeconomic Social Accounting Matrix
Micro SAM	Microeconomic Social Accounting Matrix
ROW	Rest of the World
SAM	Social Accounting Matrix

1. Introduction

This paper documents the construction of a 1993-94 social accounting matrix (SAM)[2] for Bangladesh. The SAM is based on a 1993-94 Input Output (IO) Table (BIDS 1998), 1993-94 national accounts data, 1995-96 labor and household surveys, and information from an existing SAM for 1993-94 (Khondaker [3] 1999, 1999a). Although a number of relatively recent SAMs are available for Bangladesh, none provides the desired level of disaggregation for factors of production and households. Our SAM distinguishes ten factors of production with eight different types of labor (by level of education and gender), one type of capital, and one type of land. It also differentiates between twelve socio-economic groups, allowing detailed analysis of household welfare and poverty. Our SAM is also the first, in our knowledge, to incorporate gender features in a systematic way, by separating female and male labor value-added for each educational level and in each sector of the economy.[4] Because the analytical focus of our planned analysis is agriculture—especially the rice sector—and the garment industry, the disaggregated SAM contains 10 agricultural sectors—including two different kinds of rice technology—and 19 manufacturing sectors, out of 43 sectors in total.

The construction of a SAM is not only an exercise in putting together a complete data set, but also an estimation process on the basis of insufficient and partly inconsistent data. The first step to achieve a consistent and balanced SAM is to build a macroeconomic SAM (Macro SAM). The Macro SAM gives an aggregated perspective of the flow-of-funds in an economy without sectoral or institutional detail. The second step is the construction of a preliminary Micro SAM. The Micro SAM disaggregates most of the

[2] For a general discussion of social accounting matrices see Pyatt and Round (1985) and Reinert and Roland-Holst (1997).

[3] We thank Bazlul Haque Khondaker for sharing with us all his data and work.

[4] Most of the gendered data were taken from the 1995-96 Labour Force Survey (LFS). Further developments of the gender features of the SAM include estimation of the activities performed —mainly by women—within the household, such as looking after children and the elderly, taking care of the sick, and preparing meals. These activities contribute significantly to human development and social welfare but are often not remunerated and hence not included in national accounts. For further discussion of this point see Appendix 3.

Macro SAM accounts with respect to desired sectoral and institutional breakdowns, subject to data availability. The accounts of the Micro SAM have to be balanced while also achieving the aggregate control totals from the Macro SAM. A cross-entropy approach to SAM estimation (Robinson, Cattaneo, and El-Said 2001) is used for the balancing process which leads from the preliminary unbalanced Micro SAM to the final estimated 1993-94 balanced Micro SAM for Bangladesh that uses all available information in a consistent framework.

The paper is organized as follows: section 2 provides a description of the 1993-94 Macro SAM, while section 3 describes the Micro SAM, including the datasets used and data transformations applied. Section 4 explains the cross-entropy approach and provides the final balanced Micro SAM of Bangladesh for 1993-94.

2. The 1993-94 Macro SAM

The Bangladesh Macro SAM for the year 1993-94 contains 24 non-zero entries. The initial Macro SAM balances the entire economy at a gross output level of Taka 2,444.4 billion and a total domestic absorption of Taka 2,674.7 billion. The difference reflects Bangladesh's trade deficit in 1993-94 of Taka 60.1 billion—Taka 158.9 billion imports at c.i.f. prices versus Taka 98.7 billion exports at f.o.b. prices—and indirect commodity taxes comprising Taka 71.4 billion.

The Bangladesh Macro SAM is “anchored” to the 1993-94 IO Table constructed by BIDS (1998). Because data availability and consistency of different data is limited, it is useful to choose a “core” publication in order to set the macroeconomic framework of the SAM. Typically, and so in the case of Bangladesh, this is the Input Output Table and/or the National Accounts, but more comprehensive, consistent, and reliable data may be available through other national studies. Data from other sources are adjusted for consistency with the national accounts and IO data to obtain a comprehensive economywide data base.
Table 1 shows the macro totals for the Bangladesh economy according to the 79 sector 1993-94 IO Table by BIDS.

Table 1 - Macro totals from 1993-94 IO Table

Macro aggregates	billion Taka
GDP at factor costs (value-added)	1,245.4
+ Indirect taxes on domestic goods and services	42.2
= GDP at market prices	1,287.6
- Exports	98.7
+ Imports	158.8
+ Indirect taxes on imported goods and services	29.2
= Total absorption	1,376.9
- Private consumption	1,134.4
- Recurrent government consumption	57.1
- Gross fixed capital formation (GFCF)	245.8
- Change in stocks	-58.8
= Computational deficit	-1.6

The computational deficit derived in the table above is only of minor interest because the sector-specific change in stock elements have been computed as residuals in the IO Table. Since there is no reliable information on changes in stocks—neither by sector nor for the economy as a whole—we neglect total changes in stocks. Consequently, final private consumption is calculated as a residual by subtracting government consumption and GFCF from total absorption as is typically done in national accounts and IO computations. Hence, final private consumption in the Macro SAM decreases to Taka 1,073.825 billion.

Table 3 presents the complete Macro SAM featuring the above mentioned national accounts data, as well as additional information on direct taxes, domestic savings, and foreign capital flows. Prior to this, in Table 2, we provide a schematic diagram which introduces the different features and the functionality of the Macro SAM.

The gray-shaded cells of the Macro SAM are immediately derived from the 1993-1994 IO Table. Transfers between all institutions—households, enterprises, government, and rest of the world—are adopted from Khondaker's SAM (1999a). The split of total value-

added between labor value-added paid directly to households and capital value-added channeled through the enterprise account is derived from the sectoral value-added split in Khondaker's SAM . Direct taxes and savings of households and enterprises are also based on information from Khondaker's SAM but were adjusted to fulfill the macroeconomic balance of the SAM. Net capital inflow from abroad is adopted from Khondaker's SAM as well, whereas government savings are computed as the difference between total government receipts and total government spending.

Table 2 – Structure of the macroeconomic social accounting matrix

	Activities	**Commodities**	**Factors**	**Households**	**Enterprises**	**Domestic Taxes**	**Tariffs**	**Government Recurrent**	**Rest of the World**	**Capital Account**	**Total**
Activities		Marketed Supply		Own HH Consump.							Activity Income (Gross Output)
Commodities	Intermediate Demand			Marketed HH Consump.				Final Gov. Consump.	Exports f.o.b.	Investment	Demand
Factors	Value-Added										Factor Income
Households			VA Labor and Land		Operating Surplus			Government Transfers	Remittances from Abroad		Household Income
Enterprises			VA Capital								Enterprise Income
Domestic Taxes		Sales Tax									Domestic Indirect Taxes
Tariffs		Import Tariffs									Import Tariffs
Government Recurrent				Income Taxes	Enterprise Taxes	Sales Tax	Import Tariffs				Gov. Recurrent Receipts
ROW		Imports c.i.f.									Foreign Exchange Outflow
Capital Account				HH Savings	Enterprise Savings			Gov. Savings	Net Capital Inflow		Total Savings
Total	Activity Expenditure	Supply	Factor Expenditure	HH Expenditure	Enterprise Expenditure	Domestic Indirect Tax	Import Tariffs	Gov. Recurr. Expenditure	Foreign Exchange Inflow	Total Investment	

Table 3 – 1993-94 Macro SAM for Bangladesh in billion Taka

	Activities	**Commodities**	**Factors**	**Households**	**Enterprises**	**Domestic Taxes**	**Tariffs**	**Government Recurrent**	**Rest of the World**	**Capital Account**	**Total**
Activities		2,444.4									**2,444.4**
Commodities	1,199.2			1,073.8				57.1	98.7	245.8	**2,674.7**
Factors	1,245.2										**1,245.2**
Households			609.3	32.4	586.7			25.6	48.1		**1,302.1**
Enterprises			635.9								**635.9**
Domestic Taxes		42.2									**42.2**
Tariffs		29.2									**29.2**
Government Recurrent				7.1	16.8	42.2	29.2				**95.3**
ROW		158.9									**158.9**
Capital Account				188.8	32.4			12.6	12.0		**245.8**
Total	**2,444.4**	**2,674.7**	**1,245.2**	**1,302.1**	**635.9**	**42.2**	**29.2**	**95.3**	**158.9**	**245.8**	

3. The 1993-94 Micro SAM

Constructing a Micro SAM involves a process in which the main account types contained in the Macro SAM and their non-zero data entries are disaggregated to provide a more detailed picture of all flows in the economy. Several factors are taken into account when deciding on the level of disaggregation. Because the main focus of our analysis is the impact of trade liberalization on the poor, we constructed a fairly disaggregated labor market and household structure. Special attention was given to the gender features of the economy, which are important to understand overall outcomes, both at markets and household levels. Disaggregation depends, of course, on the availability of data. Various sources were used and several informed judgments were needed, due to missing information or inconsistencies between different data sets.

3. 1. Disaggregation of the production and commodity accounts

The main data source that forms the basis of the 1993-94 Micro SAM is the 1993-94 IO Table. The production of goods and the supply of commodities to domestic and export markets makes up the largest part of the Micro SAM. The 1993-94 Micro SAM distinguishes between 43 productive activities, which are an aggregation of the 79 activities in the 1994-94 IO Table. [5]

Of the 43 productive activities defined in the Micro SAM, 10 are agricultural activities, 19 are manufacturing activities, and 14 are service activities. However, the Micro SAM has only 42 commodities. In most cases, the activity is the sole producer of its respective commodity. The only exception is the commodity paddy, which is produced by two activities (associated with different production technologies representing *aman* and *boro* cropping). Aman constitutes about 44 percent of total rice production, is rain-fed and slightly more labor intensive than boro, which is an irrigated crop with higher fertilizer inputs and higher yields.[6] The Micro SAM makes also a distinction between several textile sectors and separates out the ready-made garment sector, for its strategic importance in exports. The complete sectoral disaggregation of the Micro SAM is presented in Table 4.

[5] The way in which the 79 IO sectors were aggregated into the 43 SAM sectors is shown in Appendix 4. More precisely, the 79 IO sectors were aggregated into 42 SAM sectors, and later one sector, paddy, was split into two, *aman* and *boro*.

Table 4 – Activities and commodities in the Micro SAM

	Activities	Description	Commodities
1	AAMAN	Aman rice	CPADDY
2	ABORO	Boro and Aus rice	CPADDY
3	AGRAINS	Grains	CGRAINS
4	AJUTE	Jute	CJUTE
5	ACOMCROP	Commercial crops	CCOMCROP
6	AOTHCROP	Other crops	COTHCROP
7	ALIVESTO	Livestock	CLIVESTO
8	APOULTRY	Poultry	CPOULTRY
9	AOTHFISH	Fishing	COTHFISH
10	AFOREST	Forestry	CFOREST
11	ARICEMIL	Rice milling	CRICEMIL
12	AATAFLOU	Ata & flour	CATAFLOU
13	AOTHFOOD	Food	COTHFOOD
14	ALEATHER	Leather	CLEATHER
15	AJUTETEX	Jute textiles	CJUTETEX
16	AYARN	Yarn	CYARN
17	AMILCLOT	Mill clothing	CMILCLOT
18	ACLOTH	Clothing	CCLOTH
19	AGARMENT	Garments	CGARMENT
20	AOTHTEXT	Other textiles	COTHTEXT
21	ATOBP	Tobacco	CTOBP
22	AWOODP	Wood & paper	CWOODP
23	ACHEM	Chemicals	CCHEM
24	AFERTI	Fertilizers	CFERTI
25	APETROP	Petroleum	CPETROP
26	ACLAYP	Clay	CCLAYP
27	ASTEEL	Steel	CSTEEL
28	AMACHIN	Machinery	CMACHIN
29	AMISCIND	Other industries	CMISCIND
30	AURBBUIL	Urban building	CURBBUIL
31	ARURBUIL	Rural building	CRURBUIL
32	ACONST	Construction	CCONST
33	AUTILITY	Electricity & water	CUTILITY
34	ATRADES	Trade	CTRADES
35	ATRANSS	Transport	CTRANSS
36	AHOUS	Housing	CHOUS
37	AHEALTH	Health	CHEALTH
38	AEDU	Education	CEDU
39	APUBADM	Public administration	CPUBADM
40	AFINS	Financial services	CFINS
41	AOTHS	Other personal services	COTHS
42	AHOTEL	Hotels	CHOTEL
43	ACOMM	Communications	CCOMM

[6] The relatively small non-irrigated *aus* season rice crop is also included in *boro*.

3.2. Disaggregation of factors and institutions

Factors

The 1993-94 Micro SAM distinguishes three factors of production: labor, land, and capital. Information on GDP at factor costs for each sector is taken from the 1993-94 IO Table. Employment and wage data are both derived from the 1995-96 Labour Force Survey (LFS) and used to compute labor value-added. Value-added to land (in the agricultural sectors) and capital (in the non-agricultural sectors) for each sector is calculated residually as the difference between sectoral GDP and total labor value-added.

Labor

Labor, distinguished by both gender and level of education, is disaggregated into eight categories:

- Female labor with no education;
- Male labor with no education;
- Female labor with low education;
- Male labor with low education;
- Female labor with medium education;
- Male labor with medium education;
- Female labor with high education;
- Male labor with high education.

No education indicates that the worker never had any formal schooling; low education means that the worker had between one and five years of education; medium education includes workers with between five and ten years of schooling, and high education refers to workers who have undertaken more than ten years of formal education.[7]

[7] This classification follows the 1995-96 LFS classification. More precisely, 'no education' is equivalent to 'no school' in the LFS, 'low education' corresponds to 'I-V class', 'medium education' is 'VI-X class', while 'high education' corresponds to 'SSC/HSC and above'.

Detailed information on sectoral employment for the eight different labor categories was extracted from the 1995-96 LFS.[8] The survey reports persons in the labor force and their activity status, as well as average weekly working time in hours, for both paid employment and unpaid family labor. Drawing on these data, employment is thus recorded in hours, which is useful because it allows us to take into account more accurately differences in time spent in market activities by different labor categories (which is particularly relevant for gender analysis), or even by the same labor category in different activities. It also allows us to record people involved in more than one activity, both in the market and non-market sphere, and to capture underemployment, which is widespread in Bangladesh.

From a glimpse at the data one can observe that female working hours constitute about 24 percent of total hours spent in market activities, mostly in agriculture (66 percent), where women constitute the vast majority of unpaid household labor; personal and household services (12 percent), where women work as maids; and textiles (8 percent), the ready made garment factories. Male hours are more spread across sectors than female hours, but mainly concentrated in agriculture (44 percent), trade (20 percent) and transports (8 percent). More than half of the workforce in agriculture does not have any education, while financial services is the sector with the highest proportion of highly educated workers. A table with the distribution of hours for each sector and each labor type is provided in Appendix 1.

Average hourly wages for the eight labor categories are also computed from the same source (1995-96 LFS). This required several calculations and assumptions, which are documented in Appendix 1, to correct for missing observations in some sectors or categories of workers. Overall, wages are the lowest in agriculture and the highest in financial services. Female wages are lower than male wages in all educational categories in each activity, but the gap is smaller in the ready-made garment sector,[9] which is by far the most female-intensive sector in the economy.

[8] Sectors in the LFS are not classified in the same way as sectors in the IO Table. Thus some adjustments had to be made to ensure correspondence between the two sources.

These adjusted data on employment and wage were then used to calculate labor value-added for each labor category in each sector. [10]

Land and Capital

Land value-added is calculated residually and accrues only to agricultural activities. It includes agricultural capital.[11] Similarly, non-agricultural capital is calculated residually and accrues only to manufacturing and service activities.

Institutions

Households

The households purchase commodities in the market, pay taxes to the government and save. They receive incomes from the sale of their labor, incomes from land and enterprises,[12] and also transfers from the government and the rest of the world. The commodities purchased and their respective values are derived from the 1995-96 Household Expenditure Survey (HES), [13] with a few adjustments, whereas information on different households' labor endowments[14] is calculated from the 1995-96 LFS. With this information, distribution of labor value-added (as computed in the previous section) to different households is possible: household shares for each labor factor are calculated and applied to the respective total value-added by factor.

The 1993-94 Micro SAM distinguishes between twelve household types, classified according to land holding size, occupation, and gender of the household's head, in rural areas, and to level of education of the household's head, in urban areas. The details are found in Table 5.

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[9] Data on this sector were complemented by additional information from garment industry surveys (Zohir, 1998).

[10] In some cases some further adjustment were required to fix negative capital value added problems. Details of all the adjustments regarding employment and wages are documented in Appendix 1.

[11] A further split between agricultural capital and different types of land is planned in the next version of the SAM.

[12] More specifically, in our current version of the SAM, agricultural households receive non-labor income from both land and (non-agricultural) enterprises while non-agricultural households receive income only from enterprises.

[13] The survey contains also information on households' own-consumption, which we plan to include in further developments of the SAM.

[14] Details about households' labor endowments are provided in Appendix 3.

Table 5 – Household types and their definition

1.Agricultural landless	Rural agricultural households who own no land
2.Agricultural marginal	Rural agricultural households who own up to 0.49 acres
3.Agricultural small	Rural agricultural households who own between 0.5 and 2.49 acres
4.Agricultural large	Rural agricultural households who own more than 2.49 acres
5.Non-agricultural poor female-headed	Rural households whose head is female and not engaged in agricultural activities, and who own less than 0.5 acres of land
6.Non-agricultural poor male-headed	Rural households whose head is male and not engaged in agricultural activities, and who own less than 0.5 acres of land
7.Non-agricultural rich female-headed	Rural households whose head is female and not engaged in agricultural activities, and who own more than 0.5 acres of land
8. Non-agricultural rich male-headed	Rural households whose head is male and not engaged in agricultural activities, and who own more than 0.5 acres of land
9.Urban illiterate	Urban households whose head has no schooling
10.Urban low educated	Urban households whose head's education is 'I-V class' (LFS definition)
11.Urban medium educated	Urban households whose head's education is either 'VI-VIII class' or 'IX-X class' (LFS definition)
12.Urban highly educated	Urban households whose head's education is either 'SSC/HSC' or 'graduate and above' (LFS definition)

Income distribution is quite unequal: urban educated households receive 28 percent of total income but constitute only 7 percent of the total working population, while landless and marginal farmers receive only 5 percent of total income despite comprising 18 percent of the working population. These latter households derive their income exclusively from labor, mostly uneducated labor (about 70 percent), while about 70 percent of the urban educated households' income comes from capital. Small farmers and large farmers are the only groups receiving income from land.[15]

[15] This is a simplification made due to lack of data. In the future we intend to construct a more realistic map of the allocation of land. Scattered information indicates that non-agricultural rural households, and urban households, also own land.

Table 6 – Percentage distribution of SAM households

SAM Households	No. of hhlds in the LFS sample	%
Ag landless	210	1.5
Ag marginal	2,420	17.3
Ag small	2,434	17.4
Ag large	1,079	7.7
Nag pfhh	220	1.6
Nag pmhh	2,067	14.8
Nag rfhh	30	0.2
Nag rmhh	1,001	7.1
Urban no ed	1,480	10.6
Urban low ed	1,014	7.2
Urban med ed	853	6.1
Urban high ed	1,200	8.6
Total	14,008	100.0

Source: Computed from 1995-95 LFS

This household typology closely follows the household classification of Khondakher's SAM (1999a), with the only difference being that our SAM disaggregates non-agricultural rural households into four further groups: poor households, both female-headed and male-headed, and non-poor households, similarly differentiated by the gender of the head. Another version of Khondaker's SAM (1999) has different household types, and includes, among others, one category consisting of all households headed by women. It was felt that women-headed households are too diverse to be lumped together as an homogenous socio-economic group, so a different typology was attempted in our SAM: we single out female headship in non-agricultural households in rural areas only, which seem to be among the poorest.[16]

[16] A preliminary look at the available data in the 1995-96 LFS suggests that female- headed families in urban areas are not a particularly disadvantaged group (compared with male-headed households with similar socio-economic characteristics) nor do they face specific constraints in access to resources, but this is something that needs to be confirmed (some evidence points in the other direction: availability of credit for poor women seems to be a much bigger problem in urban areas than in rural areas). However, there is still scope for improvement in the current classification, which will be taken up in further developments of the SAM. Some limitations of the current classification are discussed in Appendix 2.

Other institutions

Enterprises earn profits from capital. They pay taxes to the government, distribute profits to households, and retain some of the profits as savings.

The government receives indirect taxes (sales taxes and import tariffs) and direct taxes (enterprise taxes and individual income taxes). It spends most of its budget on final consumption of commodities, pays transfers to households, and shows a budget surplus as payment to the savings-investment account.

The rest of the world pays to the commodity accounts for the exports they receive from Bangladesh, transfers remittances to domestic households, and shows a net capital transfer into the domestic savings-investment account, while receiving the sum of all these payments through Bangladesh's imports bill.

The savings-investment account accumulates savings from all domestic institutions and the capital account balance from the rest of the world, while spending the sum of these payments on investment demand for commodities.

For good measure, row and column totals are also represented in the Micro SAM and these should ideally balance. In reality, however, a data framework of this magnitude, derived from different and sometimes contradictory sources is difficult to balance. To balance the Micro SAM, a procedure, known as the cross-entropy method, is employed. This is described in the next section.

4. Balancing the Micro SAM using a cross-entropy approach[17]

The Micro SAM entries presented in Appendix 8 are not only the result of sectoral data information and relative spreads within the various sub-groups of accounts, but also the outcome of the final balancing procedure of the SAM. A cross-entropy approach to SAM estimation is used for the balancing process, leading from the unbalanced to the balanced Micro SAM. Since data availability and data consistency are limited, the cross-entropy approach is an appropriate tool for estimating a balanced and consistent data base starting

[17]For a more detailed discussion of the cross-entropy approach to SAM estimation see Robinson, Cattaneo, and El-Said (2001).

from an unbalanced data base that contains all available information.

The SAM is defined as a matrix $T_{i,j}$ (a payment from account *j* to account *i*) of monetary flows, representing receipts and expenditures of all economic agents. Following the convention of double-entry bookkeeping, total receipts and total expenditures of a particular agent *i* have to be equal, *i.e.*, respective row and column sums are balanced:

$$y_i = \sum_j T_{i,j} = \sum_j T_{j,i}$$

Dividing every cell entry of the flow matrix T by its respective column total generates a matrix A of column coefficients:

$$A_{i,j} = \frac{T_{i,j}}{y_j} \quad \text{with} \quad \sum_i A_{i,j} = 1 \quad \forall\ j$$

In matrix notation it follows that:

$$y = A\ \ y$$

Balancing a SAM is an underdetermined estimation problem using information from many sources and various years. The cross-entropy approach[18] allows the incorporation of errors in variables, inequality constraints, and prior knowledge about any part of the SAMCnot just row and column sums. These features of the cross-entropy estimation technique allow great flexibility in incorporating specific information and implementing certain limits to which the estimation results are restricted. The general cross-entropyapproach[19] is described by the following optimization problem:

$$\min \sum_i \sum_j A^*_{i,j} \cdot \ln\left(\frac{A^*_{i,j}}{\overline{A}_{i,j}}\right)$$

$$s.t.: \sum_j A^*_{i,j}\ \ y^*_j = y^*_i \quad \text{and} \quad \sum_j A^*_{i,j} = 1 \quad \forall\ i$$

[18]Following information theory developed by Shannon (1948) and further developed by Theil (1967) the expectation of separate information values can be described as the expected information of data points: $-I(\ p:q\ ) = -\sum_{i\text{-}1}^{n} \frac{p_i\ \ln\ p_i}{q_i}$, where *q* and *p* are prior and posterior probabilities regarding a set of events E_i and *-I(p:q)* is the Kullback-Leiber (1951) measure of the Across-entropy@ distance between the two probability distributions. The cross-entropy approach minimizes the cross-entropy distance between the probability distributions that are consistent with the information in the data and the prior.

[19]As formulated by Golan, Judge, and Robinson (1994) to update an input-output table by solving for a new coefficient matrix *A* which minimizes the entropy difference between the underlying prior $\overline{A}$ and the new matrix *A*.

where $\bar{A}$ is a coefficient matrix representing the (perhaps inconsistent and unbalanced) initial data (prior) that was chosen as a starting point of the cross-entropy balancing process to achieve the desired new coefficient matrix A^*.[20] The described problem is set up to minimize the entropy difference between the two coefficient matrices which becomes more obvious by rearranging it to

$$\min \sum_i \sum_j A^*_{i,j} \cdot \left(\ln A^*_{i,j} - \ln \bar{A}_{i,j} \right)$$

Additional equality and inequality constraints can be formulated as linear Aadding-up@ constraints on various elements of the SAM. For an aggregator matrix *G*, which has ones for those Micro SAM entries that correspond to a certain Macro SAM aggregate and zeros otherwise, the formulation for k such aggregation constraints is given by

$$\sum_i \sum_j G^{(k)}_{i,j} \cdot T_{i,j} = \gamma^{(k)}$$

where $\gamma^{(k)}$ is the value of the aggregate and the T_{ij}'s are the Micro SAM flows.

Measurement errors in variables can be incorporated into the system through

$$y = \bar{x} + e$$

where *y* is a vector of row sums and $\bar{x}$ the initially known vector of column sums measured with error. The error *e* is defined as a weighted average of known constants

$$e_i = \sum_w W_{i,w} \cdot \bar{v}_{i,w}$$

where *w* is a set of weights *W*, *v* are constants, and weights are subject to

$$\sum_w W_{i,w} = 1 \quad \text{with} \quad 0 \le W_{i,w} \le 1$$

For the purposes of the Bangladesh Micro SAM, a symmetric distribution around zero given lower and upper bounds is chosen, using three weights.[21] Consequently, the optimization problem of minimizing the entropy difference now contains a term for the weights *W*

$$\min \left(\sum_i \sum_j A^*_{i,j} \cdot \left(\ln A^*_{i,j} - \ln \bar{A}_{i,j} \right) + \sum_i \sum_w W_{i,w} \cdot \ln W_{i,w} \right).$$

The explicit application of the cross-entropy estimation procedure on the Bangladesh

[20]This means that the prior $\bar{A}$ does *not* need to satisfy the model $y = \bar{A}\, y$, but the sum of its column coefficients adds up to one, *i.e.*, $\sum_i \overline{A_{i,j}} = 1 \;\forall\; j$.

[21]Note that if the error distribution is symmetrically centered around zero and all weights are equalCas their initial prior valuesCthe respective error equals zero.

Micro SAM contains a set of additional constraints that constrain various sums over sub-matrices of the SAM to their respective macro control totals that were presented in the Macro SAM.

First, within activities, the sum over all factor payments is fixed to their aggregate value as specified in the Macro SAM. As a result, total GDP at factor costs is constrained to its original value. Sectoral production may change within specified lower and upper limits, which are imposed through the error specification, allowing shifts in relative sector shares of production in the economy. Second, the foreign trade entries are constrained to their macro totals, although the relative commodity composition of imports and exports may change. Third, total final household, government, and investment demands are bound to their macro totals as reported in the Macro SAM, as well as total own household consumption. Finally, total income taxes, sales taxes, other indirect taxes, tariffs, and total remittances to households from abroad are fixed at their macro totals. Some single-cell entries are locked to their initial values if the data source applied is reliable.

The values which are fixed in our Bangladesh SAM-maker are the following:
total exports, total imports, total tariffs, total indirect taxes, total value added, total government demand and total investment.

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Appendices

Appendix 1. Adjustments of employment and wages from LFS 1995-96

Employment

Employment is expressed in terms of total number of hours worked by both paid and unpaid labor. Table 1A was constructed by putting together information on number of workers in paid and unpaid employment and weekly working hours per worker.[22] Paid employment includes regular workers, day laborers and the self-employed. The proportion of female employment in the labor force according to this limited definition is only 14% . The LFS also shows unpaid family labor in activities such as crop production, livestock, poultry, milk production and processing, collection, processing and preservation of food, collection of firewood, vegetable production, as well as cottage industries, construction and repairing. This definition of economic activity conforms to the revised 1993 UN System of National Accounts. Unpaid family labor is overwhelmingly female (79%), with no or low education, and concentrated in agriculture. If unpaid labor is added to paid employment (using the extended definition of labor force), the female/male balance changes substantially, with women becoming more than 36 % of the total.[23] According the LFS survey, on average men work longer hours than women in productive (SNA definition) activities.

Further adjustments were required as the LFS has only 40 sectors, which are not as many as (nor do they match exactly) the SAM sectors.[24] Use was made, whenever possible, of the wealth of information on employment provided in the IO Table report (BIDS 1998). In this report data on employment (in 'man-year' *(sic)*—equal to 300 full days of work) are available for the 79 sectors and in several occupations (production worker, administrative, etc.). A distinction between female and male workers is made in all sectors but agriculture (where a distinction is made only between hired and family labor).

[22] Since the sample in the LFS is of approximately 70,000 observations and the total population of Bangladesh in 1995 was about 122,000,000, the data were multiplied by a factor of 1800 and by 43 (assumption of people working 300 days—or 43 weeks—in a year) to obtain hours worked in a year by the total labor force.

[23] The reason why in table 1A female labor is only 24 % of the total is that on average women work fewer hours than men (in market activities).

[24] The correspondence between LFS sectors and IO sectors is imperfect and unclear which might be one of the causes of mismatch (for example what is included in the health, education and public administration

Since labor is categorized in the IO Table only by occupation and gender, more sectorally aggregated LFS were used to obtain a gender/education classification. However, to make maximum use of the IO employment data, employment in the LFS sectors was disaggregated into the 79 sectors by assuming that the male/female ratio in each sub-group was the same as in the IO Table (e.g. if 80% of all women working in textiles are in the garment sector in the IO, 80% of all women in the LFS textile sector were allocated to garment). Having thus obtained the male and female totals for each of the 79 sectors, these were distributed across educational categories according to the LFS proportions (assuming that the educational structures of the male and female labor forces are the same across each of the narrower sectors within a LFS sector).

sectors in the IO may be somewhat different from what is defined as sanitary, social and public administration services in the LFS).

Table 1A - Employment (million hours) in the SAM sectors, by gender and education

	No-ed male	Low-ed male	Med-ed male	High-ed male	No-ed female	Low-ed female	Med-ed female	High-ed female	F/M ratio	Total F (%)	Total M (%)
Paddy	8692.7	3933.7	1895.9	633.3	1995.1	721.6	319.2	65.3	0.2	14.7	22.2
Wheat&oth.grains	426.3	192.9	93.0	31.1	42.0	15.2	6.7	1.4	0.1	0.3	1.1
Jute	653.6	295.8	142.6	47.6	60.5	21.9	9.7	2.0	0.1	0.4	1.7
Comm.crops	423.7	191.7	92.4	30.9	24.4	8.8	3.9	0.8	0.1	0.2	1.1
Other crops	1366.6	618.4	298.1	99.6	1024.9	370.7	164.0	33.5	0.7	7.5	3.5
Livestock	5343.9	2418.3	1165.5	389.3	4503.3	1628.9	720.5	147.3	0.8	33.1	13.6
Poultry	476.2	215.5	103.8	34.7	1608.3	581.8	257.3	52.6	3.0	11.8	1.2
Other fish	77.2	83.8	152.0	107.1	136.4	16.9	12.5	7.3	0.4	0.8	0.6
Forestry	1451.7	765.4	259.9	100.7	4.6	6.1	0.0	0.0	0.0	0.1	3.8
Rice milling	108.7	84.0	71.1	36.1	181.4	51.7	7.9	4.1	0.8	1.2	0.4
Ata&flour	9.8	7.5	6.4	3.2	0.5	0.1	0.0	0.0	0.0	0.0	0.0
Other food	109.9	84.9	71.9	36.5	13.3	3.8	0.6	0.3	0.1	0.1	0.4
Leather	13.0	15.6	9.3	6.8	0.5	0.3	0.2	0.0	0.0	0.0	0.1
Jute textile	78.1	94.2	56.1	41.1	0.7	0.5	0.3	0.1	0.0	0.0	0.4
Yarn	88.6	106.9	63.7	46.6	16.5	12.0	5.9	1.7	0.1	0.2	0.4
Mill cloth	35.8	43.2	25.7	18.8	1.2	0.9	0.4	0.1	0.0	0.0	0.2
Other cloth	484.5	584.5	348.3	254.8	103.1	75.1	37.0	10.8	0.1	1.1	2.4
RM garments	81.0	97.8	58.3	42.6	612.9	446.8	219.9	64.5	4.8	6.4	0.4
Other textiles	25.9	31.2	18.6	13.6	36.7	26.7	13.2	3.9	0.9	0.4	0.1
Tobacco products	27.5	21.2	18.0	9.1	27.7	7.9	1.2	0.6	0.5	0.2	0.1
Wood&paper	186.4	166.8	112.4	64.7	108.6	41.3	19.6	2.2	0.3	0.8	0.8
Chemicals	29.3	100.2	71.1	78.5	19.8	4.1	3.1	14.6	0.1	0.2	0.4
Fertilizers	4.3	14.8	10.5	11.6	1.2	0.2	0.2	0.9	0.1	0.0	0.1
Petroleum	1.2	0.6	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Clay&pottery	310.5	149.9	68.7	28.3	80.8	10.7	2.7	0.0	0.2	0.4	0.8
Steel	41.0	104.0	91.9	33.3	2.1	1.2	0.0	0.0	0.0	0.0	0.4
Machinery	17.7	44.9	39.6	14.4	5.6	3.2	0.0	0.0	0.1	0.0	0.2
Misc. industries	33.9	59.7	50.2	35.7	29.0	16.4	4.3	0.0	0.3	0.2	0.3
Urban building	427.6	338.2	126.8	67.8	7.8	4.5	0.0	0.0	0.0	0.1	1.4

Table 1A (continued)

	No-ed male	Low-ed male	Med-ed male	High-ed male	No-ed female	Low-ed female	Med-ed female	High-ed female	F/M ratio	Total F (%)	Total M (%)
Rural building	153.5	121.4	45.5	24.3	6.2	3.6	0.0	0.0	0.0	0.0	0.5
Construction	418.7	139.5	56.9	73.8	86.1	0.0	0.0	0.0	0.1	0.4	1.0
Utilities	36.7	44.3	44.7	126.9	3.3	0.0	0.0	11.1	0.1	0.1	0.4
Trade	3828.0	4050.6	3465.5	2618.8	500.5	104.1	61.5	12.9	0.0	3.2	20.4
Transport	3317.5	1511.4	623.1	307.7	37.4	17.5	1.3	10.9	0.0	0.3	8.4
Housing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Health	3.4	13.9	28.0	147.5	9.7	4.2	7.7	57.0	0.4	0.4	0.3
Education	17.0	69.6	140.1	718.8	22.1	20.9	38.5	284.8	0.4	1.7	1.4
Pub. Administr.	72.4	146.9	312.7	962.0	24.1	6.0	47.2	129.5	0.1	1.0	2.2
Financial services	15.9	50.9	75.2	438.3	0.0	3.7	6.2	27.6	0.1	0.2	0.8
Other services	986.0	1085.9	830.0	458.7	1866.0	416.3	205.7	95.0	0.8	12.2	4.9
Hotels	219.9	264.6	134.4	115.6	48.0	4.3	3.4	1.6	0.1	0.3	1.1
Communications	83.5	59.9	56.7	83.7	0.0	4.3	0.0	9.1	0.0	0.1	0.4
Total	30178.9	18424.4	11334.7	8394.1	13252.2	4664.3	2181.8	1053.7	0.3	100.0	100.0

The allocation of total labor across agricultural sub-sectors followed the IO employment structure (as in the non-agricultural sectors). There was however no information on the male/female split. The LFS data indicate that the female/male ratio in agriculture (including— mainly female—unpaid labor) is on average 0.47. This ratio was corrected for each agricultural IO sub-sector on the basis of some evidence provided in Safilios-Rothschild and Mahmud (1989). This report does not provide actual ratios by crop but suggests what are the most female-intensive crops and to what extent: poultry and livestock are the domain of women, who are also quite heavily involved in homestead agriculture (vegetables, fruits, spices, etc.); women also work in the rice sector, but probably less than men (and on specific tasks which can be carried out within the homestead), while all commercial crops are more male-intensive. So the ratios were set as follows:

Table 2A – Female/Male Employment Ratios in Agriculture

Paddy	0.205
Wheat	0.089
Other Grains	0.071
Jute	0.082
Sugarcane	0.059
Potato	0.846
Vegetables	1.098
Pulses	1.019
Oilseeds	0.874
Fruits	1.178
Cotton	0.021
Tobacco	0.020
Tea	0.063
Major Spices	0.752
Other Crops	0.065
Livestock	0.751
Poultry	3.011

The resulting distribution of women's working hours in agriculture has more than 65% allocated to livestock and poultry, about 22% to rice, and about 9% to homestead produce.

Wages

Because some cells with few observations were producing odd results, the LFS sectors were aggregated into fewer broader categories in order to calculate the hourly wage rates.[25] The relative wages of different education and gender categories in each broad sector were therefore applied to all the narrower sectors within the broad sector concerned. The wages were calculated as weighted average of earnings of regular workers, daily laborers and self-employed, with hours worked by each group as the weights.

It was possible to calculate earnings only for paid workers. To allow for the earnings of unpaid workers, the total wage bill in each sector was kept constant, and all wages in each sector lowered in proportion to the ratio of total unpaid workers to total paid workers over total paid workers in that sector.[26] This procedure assumes that the recorded earnings of paid workers are shared with (or redistributed to) unpaid workers in a particular way (and that unpaid workers are not remunerated out of non-labor value added). [27] The sector affected the most is agriculture; changes in other sectors are marginal. Wages in the garment sector were also slightly changed to reflect evidence that the female/male wage gap is lower in this sector than it is in other light manufacturing (Zohir 1998).

Further adjustments

The employment figures for the 79 sectors obtained after all these adjustments were then multiplied by the wages estimated for the broad LFS categories, and the resulting labor value added compared with the available data on total sectoral value added. Applying our labor value added would have resulted in some sectors having negative capital value added. This could be because of inconsistencies of sectoral coverage between the value added and employment data, or it might be because of variation in wages within the broad

[25] An explanation of how the 40 LFS sectors were aggregated is provided in the corresponding Excel files.
[26] Attempts based on other assumptions generated less plausible results.
[27] A better option than assuming that all unpaid labor is paid out of other workers' wages, might be to assume a share of 50 % out of labor and 50% out of capital. Given the total value added in agriculture, however, this would leave only an implausibly small amount of non-labor value added (possibly also because total value added in agriculture seems to be understated).

LFS categories created for wage estimation (for example, other data[28] suggest that wages for poultry and livestock are much lower than wages for agricultural crops, and that wages in the clay and pottery sector are much lower than wages in other heavy industry sectors).

To solve this problem of negative non-labor value added, [29] either wages or employment figures were lowered by an arbitrary amount. [30]

Appendix 2. Household classification

Some suggestions for improvement of the current classification of households are made here:

1. Non-agricultural rural households are defined by us, and similarly by Khondakher (1999a), as families whose head is not engaged in agricultural activities. However it is often the case that these households still own land (indeed even some urban households appear to own significant amounts of land) and that other family members are working on it. Another possible criterion for differentiating between agricultural and non-agricultural households would be what activity provides the main source of income (but this information might not be available).

2. The difference between poor and non-poor non-agricultural households is based on land ownership (families with less than 0.49 acres were all classified as poor, families with more than that as rich). This could be changed to be based on level of income instead.

3. In the current classification landless farmers are only those who own no land at all. It might be better to adopt the definition of functionally landless (e.g. owning less than 0.04 acres).

[28] IO report (BIDS 1998), Appendix 11.
[29] But following however some common beliefs on sectoral labor/capital intensity.
[30] This problem was particularly large in the public sectors.

4. Much controversy surrounds the issue of female-headed households, the emphasis on them as the most vulnerable group and the difficulties in concepts and interpretation of statistics regarding them. [31] One common problem is the difference in perceptions among respondents, interviewers and researchers of what constitutes female headship and what is socially acceptable (which often leads to under-reporting in official statistics). This emerges, for example, in the study of Bangladeshi female-headed households by Shamim Hamid (in Rahman and Hossain 1995), who shows how including *de facto* female-headed households (or rather what she defines as such) in addition to *de jure* female-headed households (the only ones recorded in official statistics), produces a quite different picture. More importantly in our view, there is the issue of why a researcher may wish to single out female-headed households. Although much of the interest in household headship arises because of perceived differences between households headed by women and those headed by men, some of the focus on female-headed household results from interest in gender disaggregation combined with the difficulty in individualizing most household data. Female-headed households are hence used as a proxy for the missing gender breakdowns (Budlender 1997). If that is the case, efforts are better placed in collecting individual-disaggregated data in consumption, time use, etc. (and encouraging further collection of such data): these would help more than the simple distinction between male-headed and female-headed households in capturing inequalities in gender relations.

Appendix 3. Households' labor endowments and first steps toward estimating the value of non-market activities.

Households' labor endowments

The 1995-96 LFS records both workers who are in paid employment and workers who work as unpaid family labor. In addition the survey reports that some (mainly women) are engaged full-time in household work. The proportion of these three categories in total availability of people of working age varies with the type of household. Non-agricultural poor female-headed households are the households with by far the highest proportion of

31 For an excellent discussion of all these issues see Budlender (1997) and also IFPRI Gender CG Newsletter (1995).

workers in paid employment (80% of the total).[32] On average, the proportion of paid workers seems to be slightly higher in urban households, which also have the highest proportion of full time housewives. Agricultural small and large households have, as expected, the highest proportion of unpaid family labor.

In landless households, the majority of paid work is done by men (75%), mostly with no education (63% of total paid workers). Uneducated female workers are 20 % of the total working family members. Similar patterns can be seen among marginal farmers, while, among small and large farmers, the gender and educational composition of the family members engaged in paid activities has a greater male dominance and higher levels of education. Working family members in these households are almost exclusively men (91% in small-farmer households and 93% in large-farmer households). More than half of these working men have some education. In large-farmer households more than 5 % of working men have university degrees. Among non-agricultural households, male-headed households have the same structure as agricultural households of corresponding land ownership categories, while the situation is totally reversed for female-headed households, both poor and rich, where women constitute the majority of working family members (80 % and 63% respectively). Most of these women do not have any education, and a few have some primary education. In urban families, about 20 percent of working family members are women in illiterate and highly educated households, while this percentage is lower (about 13%) in both low and medium educated households. Similarly the majority of paid workers is constituted by illiterate males (67%) in illiterate households, low-educated males (71%) in low-educated households, medium-educated males (76%) in medium-educated households and highly-educated males (74%) in highly-educated households. It is interesting to note that women's participation in paid work declines as the socio-economic status of their families improves in rural areas (women work in landless and marginal households, as well as in female-headed households, only because of need), while in urban areas it declines only up to a certain point, to increase once again in the most highly educated households.

[32] These households are smaller in size than most households, and with a much higher proportion of women. Because of economic need these women do not have the 'choice' to be unpaid workers or full-time housewives (these are both options for women in working age, while most men would be in paid work anyway).

Most unpaid family workers belong to rural households: 62% of total unpaid workers are in agricultural households and 26% are in non agricultural households. The gender distribution is the exact opposite of that among paid workers: women are the large majority of unpaid family workers in all types of households. They are about 80 % of total unpaid workers, and most of them (63%) have no education. Women are about 93% of total unpaid workers in landless and marginal farmers households, while they are about 80% in small farmer households. In large farmer households unpaid family workers are more evenly distributed across both genders (64 % are women and 36% men) and educational levels (45 % have no education but about 30% have at least primary and 6% high education).

The prevalence of women among people engaged in household work is even more striking than it is among unpaid family workers. In all households people in full-time household work are almost exclusively women, with the exception of poor non-agricultural female-headed households where 8% is male. In absolute terms, the highest number of men in full time household work (still very few however) can be found in urban households.

Allocation of time between market and non-market activities

Time use data in Bangladesh are quite sparse. There are a few *ad hoc* surveys (for example IFPRI-BIDS-INFS 1998, and Hamid 1996). However in none of these surveys is the sample representative of the total population - both cover only rural areas, and indeed only specific districts. The 1990-91 (but it seems not the 1995-96) Labour Force Survey reports information on weekly hours spent in household activities, but the way these activities are classified is not always clear. The 1995-96 LFS reports weekly working hours for both workers in paid employment and unpaid family labor, but does not provide the same information for people whose activity status is 'household work'.

Hence compiling a matrix of the allocation of time between market activities, social

reproduction[33] and leisure for the eight labor types in each of the twelve households would prove quite difficult and would require several assumptions. A better and wider collection of data on time use is strongly encouraged as this could provide the basis for further useful economic analysis with a gender focus.

Only some points are made here as first steps toward constructing a more gender-sensitive SAM that incorporates non-market activities. Drawing on some evidence (mainly from Hamid 1996), a few 'rules' governing the allocation of social reproduction time can be set up:

- Men spend less than half the time of women in social reproduction, and this holds across all household types.
- While there is no variation in the (little) time spent in social reproduction by men across socio-economic groups, there is some across-household variation in the time women allocate to social reproduction.
- Women in relatively well-off households (the large farmers, the non-agricultural rich male-headed, the urban medium educated and the urban highly educated) spend about 20% less time than women in other households on social reproduction.

The LFS does not provide information on the amount of hours worked by people who are full-time house workers. If all the necessary data on time spent in social reproduction were available, an estimation of the monetary value of non-market productive activities could be made (based on the principle of the opportunity cost - see Fontana and Wood (2000) - or other methodology), and this could be included in the SAM, thus providing a much better account of women's and men's work.

[33] This is one of the terms commonly used in the literature to describe the many household activities, such as cleaning and cooking, looking after children and elderly people, which are an important but rarely recognized form of production, often performed by women. Another frequently used term is 'unpaid care work'.

Appendix 4 —Aggregation of the 79 IO sectors into the 43 SAM sectors

	SAM sectors	IO sectors
1	AAMAN	Paddy
2	ABORO	Paddy
3	AGRAINS	Wheat, Other grains
4	AJUTE	Jute
5	ACOMCROP	Sugarcane, Tobacco, Tea, Cotton
6	AOTHCROP	Potato, Vegetables, Pulses, Oilseeds, Fruits, Major spices, Other crops
7	ALIVESTO	Livestock
8	APOULTRY	Poultry
9	AOTHFISH	Shrimp, Other fish
10	AFOREST	Forestry
11	ARICEMIL	Rice milling
12	AATAFLOU	Ata & flour
13	AOTHFOOD	Fish & seafood processing, Edible oil, Sugar and gur, Salt, Other food, Tea processing
14	ALEATHER	Tanning & Leather finishing, Leather products
15	AJUTETEX	Jute bailing, Jute textiles
16	AYARN	Yarn
17	AMILCLOT	Mill clothing
18	ACLOTH	Handloom cloth, Dyeing & bleaching
19	AGARMENT	Ready-made garments, Knitting & hosiery
20	AOTHTEXT	Other textiles
21	ATOBP	Cigarettes, Bidi
22	AWOODP	Saw & planning mills, Wooden furniture, Pulp, paper & board, Printing and publishing
23	ACHEM	Drugs & pharmaceuticals, Other chemicals
24	AFERTI	Fertilizers
25	APETROP	Petroleum products
26	ACLAYP	Pottery & earthenware, China & ceramic, Glass & glass products, Bricks, Tiles and tiles products, Cement
27	ASTEEL	Iron & steel basic industry, Fabricated metal products
28	AMACHIN	Machinery, Transport equipment
29	AMISCIND	Miscellaneous industries
30	AURBBUIL	Urban building
31	ARURBUIL	Rural building
32	ACONST	Construction: electricity & gas, Construction: rural road, Construction: other transport, Other construction
33	AUTILITY	Electricity, Gas, Mining & quarrying
34	ATRADES	Trade services
35	ATRANSS	Transport services
36	AHOUS	Housing services
37	AHEALTH	Health services
38	AEDU	Education services
39	APUBADM	Public administration
40	AFINS	Banking & insurance, Professional services
41	AOTHS	Other services
42	AHOTEL	Hotels & restaurants
43	ACOMM	Communications

Appendix 5 — Structure of the Bangladesh economy by activity (as % of total)

	GDP f.c.	Production	Labor	Capital	Land
AAman	3.9	3.5	5.2		13.0
ABoro	4.5	4.4	5.4		17.0
AGrains	0.3	0.4	0.5		0.9
AJute	0.5	0.4	0.7		1.1
AComCrop	0.8	0.8	0.5		4.6
AOthCrop	3.6	3.5	1.9		21.3
ALivesto	2.7	2.8	4.3		6.7
APoultry	0.6	0.7	0.8		1.9
AOthFish	2.8	3.1	0.4		20.7
AForest	2.3	2.8	1.5		12.8
ARiceMil	2.0	9.2	0.6	4.0	
AAtaFlou	0.3	0.7	0.0	0.7	
AOthFood	1.7	3.4	0.6	3.4	
ALeather	0.2	0.6	0.1	0.4	
AJuteTex	0.3	0.8	0.5	0.2	
AYarn	0.4	0.7	0.7	0.3	
AMilClot	0.2	0.4	0.2	0.3	
ACloth	1.4	2.3	2.8	0.5	
AGarment	1.5	2.8	2.9	0.5	
AOthText	0.1	0.1	0.2	0.0	
ATobP	0.5	0.5	0.2	1.1	
AWoodP	0.6	1.1	1.2	0.3	
AChem	0.7	1.2	0.8	0.8	
AFerti	0.1	0.5	0.1	0.2	
APetroP	0.6	0.7	0.0	1.3	
AClayP	0.3	0.4	0.4	0.3	
ASteel	0.6	1.2	0.6	0.8	
AMachin	0.3	0.4	0.3	0.3	
AMiscInd	0.7	0.7	0.4	1.1	
AUrbBuil	1.7	2.0	1.8	2.0	
ARurBuil	7.5	6.3	0.6	16.6	
AConst	0.7	1.1	1.4	0.3	
AUtility	2.4	1.7	1.1	4.3	
ATradeS	16.2	10.9	28.5	8.6	
ATransS	13.8	10.2	11.0	20.7	
AHous	7.0	4.8		16.2	
AHealth	0.8	0.8	0.7	1.2	
AEdu	1.8	1.3	3.6	0.6	
APubAdm	2.5	1.9	4.7	1.1	
AFinS	5.5	4.8	2.6	10.1	
AOthS	3.9	2.2	8.4	0.7	
AHotel	0.6	0.9	0.9	0.4	
AComm	0.7	0.4	0.8	0.8	
Tot Agriculture	22.2	22.5	21.3	100.0	100.0
Tot Non-Agriculture	77.8	77.5	78.7		
Total	100.0	100.0	100.0	100.0	100.0

Appendix 6 — Structure of the Bangladesh economy by commodity

	Composition (% of total)				
	Exports	Imports	Absorption	Exports (% of output)	Imports (% of absorption)
CPaddy			7.2		
CGrains		2.6	0.5		33.3
CJute			0.4		
CComCrop	0.0	4.3	1.0	0.0	26.5
COthCrop	0.3	1.1	3.3	0.4	2.3
CLivesto	0.1	0.9	2.6	0.1	2.0
CPoultry		0.0	0.7		0.1
COthFish	7.7		2.9	10.0	
CForest			2.6		
CRiceMil			8.4		
CAtaFlou		0.0	0.7		0.2
COthFood	4.9	2.3	3.5	5.7	6.9
CLeather	11.0	0.1	0.6	69.4	2.5
CJuteTex	11.1	0.1	0.8	53.0	2.3
CYarn	0.1	5.5	1.1	0.7	34.2
CMilClot	0.0	15.1	1.4	0.2	71.1
CCloth			2.1		
CGarment	60.8	0.5	2.6	87.5	8.1
COthText	1.0	1.6	0.2	37.7	61.2
CTobP	0.0	0.1	0.8	0.0	0.4
CWoodP	0.0	2.1	1.2	0.0	13.7
CChem	0.2	10.3	2.0	0.7	37.3
CFerti	0.7	1.2	0.5	6.2	14.7
CPetroP	0.3	9.7	1.5	1.9	48.1
CClayP	0.2	5.3	0.8	2.1	44.0
CSteel	0.1	11.5	2.0	0.2	39.5
CMachin	0.4	21.1	2.0	4.4	74.0
CMiscInd	0.9	4.7	1.1	5.1	36.0
CUrbBuil			1.8		
CRurBuil			5.7		
CConst			1.0		
CUtility			1.7		
CTradeS			10.0		
CTransS			9.4		
CHous			4.4		
CHealth			0.7		
CEdu			1.2		
CPubAdm			1.7		
CFinS			4.4		
COthS			2.0		
CHotel			0.9		
CComm			0.4		
Total	100.0	100.0	100.0		

Appendix 7 — Structure of production by activity

	% of total VA			Inputs (% of gross output)
	Labor	Capital	Land	
AAman	57.4		42.6	42.3
ABoro	51.8		48.2	47.7
AGrains	63.7		36.3	56.2
AJute	69.0		31.0	46.2
AComCrop	27.4		72.6	47.6
AOthCrop	23.5		76.5	48.2
ALivesto	68.5		31.5	50.4
APoultry	59.9		40.1	56.3
AOthFish	6.3		93.7	53.5
AForest	28.0		72.0	58.5
ARiceMil	12.5	87.5		89.1
AAtaFlou	6.9	93.1		78.9
AOthFood	14.4	85.6		74.3
ALeather	18.8	81.2		84.8
AJuteTex	66.6	33.4		81.3
AYarn	71.8	28.2		70.9
AMilClot	45.1	54.9		69.4
ACloth	84.1	15.9		68.5
AGarment	84.9	15.1		73.1
AOthText	93.1	6.9		64.2
ATobP	14.2	85.8		48.2
AWoodP	80.3	19.7		69.5
AChem	49.5	50.5		70.2
AFerti	41.8	58.2		87.6
APetroP	0.2	99.8		56.5
AClayP	54.3	45.7		63.0
ASteel	41.9	58.1		73.6
AMachin	43.3	56.7		66.6
AMiscInd	28.9	71.1		52.6
AUrbBuil	47.2	52.8		57.7
ARurBuil	3.7	96.3		39.1
AConst	84.0	16.0		68.0
AUtility	20.5	79.5		28.4
ATradeS	76.8	23.2		24.5
ATransS	34.8	65.2		31.3
AHous		100.0		25.0
AHealth	38.6	61.4		48.4
AEdu	86.2	13.8		29.7
APubAdm	80.7	19.3		31.5
AFinS	20.4	79.6		42.0
AOthS	92.7	7.3		9.8
AHotel	71.5	28.5		69.6
AComm	48.3	51.7		17.8
Ag average	41.8		58.2	
Non-ag average	44.1	55.9		
Total average	43.6	43.5	12.9	

Appendix 8 - The 1993-94 social accounting matrix for Bangladesh

	APaddy1	APaddy2	AGrains	AJute	AComCrop	AOthCrop	ALivesto	APoultry	AOthFish	AForest	ARiceMil	AAtaFlou	AOthFood	ALeather	AJuteTex	AYarn
APaddy1																
APaddy2																
AGrains																
AJute																
AComCrop																
AOthCrop																
ALivesto																
APoultry																
AOthFish																
AForest																
ARiceMil																
AAtaFlou																
AOthFood																
ALeather																
AJuteTex																
AYarn																
AMilClot																
ACloth																
AGarment																
AOthText																
ATobP																
AWoodP																
AChem																
AFerti																
APetroP																
AClayP																
ASteel																
AMachin																
AMiscInd																
AUrbBuil																
ARurBuil																
AConst																
AUtility																
ATradeS																
ATransS																
AHous																
AHealth																
AEdu																
APubAdm																
AFinS																
AOthS																
AHotel																
AComm																
CPaddy	8.657	9.103					13.303				161.993		0.009			
CGrains			1.029				0.053	1.341				11.202	0.293			
CJute				0.342		0.342									9.136	
CComCrop					1.283								3.920			8.879
COthCrop						15.493	2.073	0.694					19.079	0.004		
CLivesto	10.321	9.411	1.275	1.044	0.691	3.801			0.239	0.003			0.321	7.931		
CPoultry								1.507					0.049			
COthFish								0.101	3.212				9.096			
CForest					0.004	0.780			0.093		0.820		0.241		0.004	
CRiceMil							2.547	1.342	0.455				0.001			
CAtaFlou							3.166	0.005	0.129				2.330		0.021	
COthFood						0.088	4.461	0.202	0.402			0.002	9.942	0.071	0.010	0.006
CLeather													0.002	0.816		
CJuteTex	0.003	0.006					0.094	0.008	0.061	0.001	1.533	0.109	0.287	0.022	0.099	
CYarn									0.200					0.002	0.199	0.007
CMilClot													0.020	0.086	0.051	
CCloth																
CGarment																
COthText																
CTobP																
CWoodP					0.038			0.029	0.387		0.243	0.011	0.886	0.054	0.057	0.008
CChem	2.024	2.782	0.103	0.180	0.293	0.464	0.675	0.785	0.250	0.001	0.005	0.002	0.886	1.997	0.391	0.373
CFerti	3.009	4.979	1.227	0.317	1.062	1.958	0.014		0.167	0.001						
CPetroP	0.128	2.077	0.110	0.016	0.072	0.078		0.031	1.224		0.496	0.019	0.892	0.017	0.184	0.023
CClayP							0.137				0.006		0.061			
CSteel					0.005		0.097	0.039	0.322	0.096	0.093	0.070	0.943	0.135	0.871	0.308
CMachin	0.275	0.363	0.032	0.007	0.020	0.103	0.007	0.075	0.313	0.348	0.625	0.209	3.193	0.262	0.643	0.903
CMiscInd					0.002	0.090	0.107	1.189	1.420	0.170	0.761	0.032	0.784	0.026	0.064	
CUrbBuil											0.327	0.090	0.859	0.113	0.182	0.174
CRurBuil											4.462	0.071	0.031		0.003	
CConst	0.130	0.224	0.017	0.002	0.002	0.012				0.008			0.004			
CUtility	0.031	0.573	0.011	0.001	0.003	0.023	0.068	0.103			7.954	0.343	1.030	0.239	1.230	1.337
CTradeS	9.328	18.205	1.187	2.365	4.720	13.100	3.155	1.801	30.919	34.291	15.858	1.812	3.628	0.671	1.328	0.348
CTransS	1.873	3.575	0.239	0.485	0.994	5.236	3.653	0.279	0.741	4.732	4.244	0.205	1.913	0.335	1.461	0.103
CHous							0.528	0.308	0.110		0.035	0.003	0.003			
CHealth							0.313	0.005			0.001		0.023	0.010		0.003
CEdu																
CPubAdm	0.024	0.045	0.012	0.014	0.076	0.036	0.019	0.005	0.023	0.728	0.010	0.008	0.223	0.056	0.052	0.078
CFinS			0.037	0.115	0.027	0.054	0.044	0.011	0.127	0.004	0.348	0.009	1.369	0.357	0.749	0.439
COthS	0.114	0.213	0.007	0.029	0.005	0.011	0.031	0.005	0.060	0.001						
CHotel													0.010			
CComm											0.056	0.015	0.241	0.127	0.051	0.015
LEdu0M	11.851	12.368	1.190	1.795	1.307	3.388	7.182	0.656	0.216	3.847	0.601	0.069	0.801	0.092	0.536	0.755
LEdu1M	6.568	6.846	0.662	0.999	0.727	1.880	3.985	0.366	0.287	2.488	0.504	0.059	0.677	0.122	0.706	0.994
LEdu2M	4.131	4.309	0.416	0.628	0.457	1.185	2.506	0.230	0.669	1.105	0.634	0.073	0.884	0.108	0.626	0.882
LEdu3M	1.842	1.919	0.186	0.281	0.205	0.531	1.119	0.103	0.629	0.574	0.486	0.057	0.659	0.120	0.695	0.980
LEdu0F	2.017	2.091	0.089	0.127	0.056	1.880	4.500	1.673	0.283	0.010	0.572	0.002	0.060	0.002	0.003	0.075
LEdu1F	1.138	1.157	0.054	0.077	0.034	1.060	2.571	0.999	0.060	0.022	0.209	0.001	0.026	0.002	0.003	0.082
LEdu2F	0.527	0.536	0.025	0.036	0.016	0.491	1.187	0.463	0.047		0.038	0.000	0.004	0.001	0.002	0.040
LEdu3F	0.116	0.120	0.005	0.007	0.003	0.108	0.252	0.097	0.027		0.030	0.000	0.003	0.000	0.001	0.016
LAND	20.904	27.154	1.495	1.771	7.427	34.197	10.724	3.072	33.230	20.634	21.428					
CAPITAL												3.533	18.510	1.938	1.292	1.504
Landless																
Marginal																
Small																
Large																
NARPF																
NARPM																
NARRF																
NARRM																
Illitera																
LowEdu																
MedEdu																
HighEdu																
CORP																
ITAX																
TAR																
GOV																
ROW																
S-I																
TOTAL	85.013	108.053	9.409	10.638	19.528	86.389	68.573	17.524	76.302	69.061	224.371	18.009	84.189	15.717	20.648	18.332

Appendix 8 (continued) - The 1993-94 social accounting matrix for Bangladesh

	AMilClot	ACloth	AGarment	AOthText	ATobP	AWoodP	AChem	AFerti	APetroP	AClayP	ASteel	AMachin	AMiscInd	AUrbBuil	ARurBuil	AConst	AUtility
APaddy1																	
APaddy2																	
AGrains																	
AJute																	
AComCrop																	
AOthCrop																	
ALivesto																	
APoultry																	
AOthFish																	
AForest																	
ARiceMil																	
AAtaFlou																	
AOthFood																	
ALeather																	
AJuteTex																	
AYarn																	
AMilClot																	
ACloth																	
AGarment																	
AOthText																	
ATobP																	
AWoodP																	
AChem																	
AFerti																	
APetroP																	
AClayP																	
ASteel																	
AMachin																	
AMiscInd																	
AUrbBuil																	
ARurBuil																	
AConst																	
AUtility																	
ATradeS																	
ATransS																	
AHous																	
AHealth																	
AEdu																	
APubAdm																	
AFinS																	
AOthS																	
AHotel																	
AComm																	
CPaddy										0.001							
CGrains					0.003												
CJute		0.342		0.002		0.004							0.013	0.009	0.347		
CComCrop	0.005		0.053	0.518	2.096	0.002							0.004				
COthCrop					0.002		0.014										
CLivesto							0.743						0.017				
CPoultry																	
COthFish																	
CForest		0.036		0.023		1.460	0.577			1.292	0.005	0.013	0.298	2.120	25.004	0.385	
CRiceMil																	
CAtaFlou		1.996				0.002	0.006						0.002				
COthFood	0.002	0.002	0.055		0.005	0.001	0.282	0.005		0.005	0.013	0.004	0.232				
CLeather											0.001		0.005				
CJuteTex						0.001	0.003			0.002	0.002			0.003	0.007	0.037	0.008
CYarn	5.161	17.987	5.858	0.267													
CMilClot		1.735	29.884	0.411		0.011	0.014	0.010			0.013	0.005	0.236				
CCloth		4.872															
CGarment			0.510														
COthText			4.173	0.035													
CTobP					0.034												
CWoodP	0.048	0.511	0.894	0.018	0.921	9.683	1.261	0.020	0.038	0.143	0.090	0.227	0.550			0.072	0.015
CChem	0.117	3.801	0.283	0.017	0.097	1.832	10.891	3.360	0.041	0.197	1.079	0.486	1.106	1.467	1.045	0.602	0.021
CFerti							0.002										
CPetroP	0.008	0.054	0.105		0.006	0.941	0.089	0.025	2.267	0.188	0.137	0.030	0.063	0.230	0.016	0.667	2.188
CClayP						0.005	0.357			0.001	0.022	0.222	0.069	5.417	8.904	2.114	
CSteel	0.087	0.074	0.896	0.012	0.183	0.593	0.395	0.524	0.812	0.224	15.908	2.138	0.397	6.135	8.039	4.194	0.029
CMachin	0.276	0.355	0.440	0.017	0.058	0.530	1.250	1.800	1.903	0.200	0.680	1.838	0.285	0.323	0.033	3.637	0.860
CMiscInd		0.116	0.538	0.019	0.182	0.482	0.453	0.177		0.770	0.068	0.024	0.912	2.755	1.020	0.814	0.168
CUrbBuil	0.052	0.053	0.808	0.011	0.021	0.244	0.410	0.394	0.326	0.113	0.251	0.209	0.133				
CRurBuil	0.009	0.144	0.004	0.090	0.001	0.059	0.002			0.079	0.022	0.003	0.215				
CConst										0.002						0.084	0.158
CUtility	0.435	0.270	0.346	0.021	0.024	0.691	0.416	1.395	0.111	2.028	1.598	0.147	1.773	1.128	1.254	2.401	3.673
CTradeS	0.261	5.316	3.247	0.062	2.444	0.686	1.897	0.274	0.468	0.451	0.836	0.196	1.433	5.036	9.152	1.282	3.399
CTransS	0.173	1.183	1.728	0.083	0.138	0.712	1.118	0.930	0.497	1.163	0.480	0.209	1.242	3.569	5.244	1.232	0.874
CHous																	
CHealth			0.002				0.003	0.007			0.031	0.005					
CEdu								0.004			0.032	0.008					
CPubAdm	0.023	0.019	0.052	0.002	0.004	0.055	0.148	0.036	0.091	0.007	0.115	0.019				0.541	0.099
CFinS	0.135	0.094	0.117	0.005	0.022	0.166	0.388	1.167	2.935	0.035	0.732	0.378	0.145	0.017		0.645	0.128
COthS																	
CHotel																	
CComm	0.005	0.003	0.215	0.004		0.034	0.095	0.014	0.018	0.011	0.032	0.117	0.072			0.026	0.005
LEdu0M	0.279	2.955	0.560	0.115	0.205	1.433	0.159	0.024	0.006	0.906	0.223	0.098	0.185	3.278	1.150	3.198	0.263
LEdu1M	0.368	3.884	1.129	0.152	0.173	1.400	1.025	0.151	0.005	0.557	1.128	0.447	0.587	3.180	1.119	1.310	0.675
LEdu2M	0.326	3.449	0.656	0.135	0.218	1.405	0.798	0.115	0.003	0.327	1.092	0.433	0.541	1.576	0.553	0.706	0.745
LEdu3M	0.363	3.821	1.110	0.150	0.168	1.228	1.920	0.283	0.002	0.191	0.866	0.343	0.840	1.681	0.592	1.826	4.016
LEdu0F	0.005	0.264	3.878	0.101	0.122	0.510	0.092	0.006	0.000	0.173	0.010	0.026	0.133	0.032	0.026	0.370	0.015
LEdu1F	0.006	0.405	4.497	0.111	0.052	0.288	0.022	0.001	0.000	0.038	0.006	0.017	0.087	0.026	0.021		
LEdu2F	0.003	0.201	2.244	0.054	0.008	0.137	0.018	0.001	0.000	0.010			0.025				
LEdu3F	0.001	0.057	1.565	0.021	0.006	0.020	0.340	0.020									0.310
LAND																	
CAPITAL	1.646	2.846	2.789	0.063	5.752	1.571	4.459	0.838	7.292	1.851	4.601	1.788	5.903	10.918	89.925	1.413	23.328
Landless																	
Marginal																	
Small																	
Large																	
NARPF																	
NARPM																	
NARRF																	
NARRM																	
Illitera																	
LowEdu																	
MedEdu																	
HighEdu																	
CORP																	
ITAX																	
TAR																	
GOV																	
ROW																	
S-I																	
TOTAL	9.796	56.844	68.637	2.519	12.945	26.182	29.645	11.583	16.816	10.967	30.072	9.429	17.502	48.900	153.453	27.557	40.978

Appendix 8 (continued) - The 1993-94 social accounting matrix for Bangladesh

	ATradeS	ATransS	AHous	AHealth	AEdu	APubAdm	AFinS	AOthS	AHotel	AComm	CPaddy	CGrains	CJute	CComCrop	COthCrop	CLivesto	CPoultry
APaddy1											85.013						
APaddy2											108.053						
AGrains												9.409					
AJute													10.638				
AComCrop														19.528			
AOthCrop															86.389		
ALivesto																68.573	
APoultry																	17.524
AOthFish																	
AForest																	
ARiceMil																	
AAtaFlou																	
AOthFood																	
ALeather																	
AJuteTex																	
AYarn																	
AMilClot																	
ACloth																	
AGarment																	
AOthText																	
ATobP																	
AWoodP																	
AChem																	
AFerti																	
APetroP																	
AClayP																	
ASteel																	
AMachin																	
AMiscInd																	
AUrbBuil																	
ARurBuil																	
AConst																	
AUtility																	
ATradeS																	
ATransS																	
AHous																	
AHealth																	
AEdu																	
APubAdm																	
AFinS																	
AOthS																	
AHotel																	
AComm																	
CPaddy																	
CGrains				0.001													
CJute																	
CComCrop																	
COthCrop				0.023			0.279		2.524								
CLivesto				0.057					2.332								
CPoultry				0.052					1.741								
COthFish				0.017					1.683								
CForest																	
CRiceMil				0.008					0.694								
CAtaFlou				0.002					1.017								
COthFood	8.363			0.010	0.004	0.046	1.566	0.119	2.777								
CLeather	0.038																
CJuteTex	1.179			0.002			0.010	0.012		0.006							
CYarn							0.033	0.018									
CMilClot	0.028	0.014		0.149	0.076	0.127	0.252	0.745		0.009							
CCloth				0.013	0.003												
CGarment																	
COthText																	
CTobP							0.030	0.178									
CWoodP	1.308	0.031	0.122	0.027	0.792	0.633	3.281	0.054	0.054	0.119							
CChem	3.102	0.123		1.616	0.232	0.443	1.488			0.069							
CFerti																	
CPetroP	0.145	13.595	0.002	0.096	0.375	0.521	0.195			0.026							
CClayP							0.015		0.265								
CSteel	0.062	0.029			0.035		0.239	1.052									
CMachin	0.295	5.804	0.002	0.003	0.761	0.701	0.279	0.482		0.066							
CMiscInd	9.344	0.401		0.031	0.348	1.560	1.123	0.178	0.035	0.047							
CUrbBuil	0.356	0.005	3.492	0.060	0.152	4.104	0.133										
CRurBuil		0.014	4.016		0.262					0.011							
CConst		0.040															
CUtility	3.120	0.141		0.178	0.612	0.490	0.888	0.055	0.838	0.096							
CTradeS		37.359	19.078	6.291	4.357		19.816		1.118								
CTransS	3.698	11.584	0.003	0.070	0.180	1.242	10.658	2.137	0.173	0.149							
CHous	13.243	0.476		0.618	0.019	0.017	5.036	0.297	0.445	0.320							
CHealth		0.029															
CEdu																	
CPubAdm	4.363	3.670	0.002	0.108	0.711	1.213	0.180		0.190								
CFinS	7.989	0.425	2.506	0.190	0.120	1.015	0.427		0.019	0.045							
COthS	3.715	4.017			0.189	0.004	1.982			0.073							
CHotel		0.566			0.090	0.178	0.383			0.017							
CComm	5.004	0.065	0.001	0.069	0.301	2.202	1.230		0.027	0.861							
LEdu0M	33.348	28.623		0.028	0.141	0.616	0.148	8.053	1.159	0.699							
LEdu1M	40.552	15.160		0.151	0.761	1.621	0.609	9.794	1.626	0.591							
LEdu2M	40.247	7.839		0.342	1.720	3.879	1.033	8.332	0.954	0.697							
LEdu3M	37.078	7.662		2.580	12.697	17.159	11.409	9.442	1.015	2.066							
LEdu0F	2.578	0.226		0.055	0.125	0.136		5.984	0.163								
LEdu1F	0.477	0.152		0.025	0.124	0.036	0.027	1.828	0.016	0.044							
LEdu2F	0.392			0.054	0.262	0.320	0.088	1.113	0.018								
LEdu3F	0.169	0.184		0.759	3.783	1.716	0.673	0.838	0.016	0.176							
LAND																	
CAPITAL	46.717	112.279	87.702	6.359	3.134	6.101	54.529	3.579	1.984	4.567							
Landless																	
Marginal																	
Small																	
Large																	
NARPF																	
NARPM																	
NARRF																	
NARRM																	
Illitera																	
LowEdu																	
MedEdu																	
HighEdu																	
CORP																	
ITAX														0.020	0.074		
TAR												0.521		0.137	0.266		
GOV																	
ROW												4.169		6.896	1.732	1.408	0.010
S-I																	
TOTAL	266.909	250.515	116.925	20.045	32.365	46.081	118.037	54.291	22.883	10.753	193.066	14.099	10.638	26.581	88.462	69.980	17.534

Appendix 8 (continued) - The 1993-94 social accounting matrix for Bangladesh

	COthFish	CForest	CRiceMil	CAtaFlou	COthFood	CLeather	CJuteTex	CYarn	CMilClot	CCloth	CGarment	COthText	CTobP	CWoodP	CChem	CFerti	CPetroP
APaddy1																	
APaddy2																	
AGrains																	
AJute																	
AComCrop																	
AOthCrop																	
ALivesto																	
APoultry																	
AOthFish	76.302																
AForest		69.061															
ARiceMil			224.371														
AAtaFlou				18.009													
AOthFood					84.189												
ALeather						15.717											
AJuteTex							20.648										
AYarn								18.332									
AMilClot									9.796								
ACloth										56.844							
AGarment											68.637						
AOthText												2.519					
ATobP													12.945				
AWoodP														26.182			
AChem															29.645		
AFerti																11.583	
APetroP																	16.816
AClayP																	
ASteel																	
AMachin																	
AMiscInd																	
AUrbBuil																	
ARurBuil																	
AConst																	
AUtility																	
ATradeS																	
ATransS																	
AHous																	
AHealth																	
AEdu																	
APubAdm																	
AFinS																	
AOthS																	
AHotel																	
AComm																	
CPaddy																	
CGrains																	
CJute																	
CComCrop																	
COthCrop																	
CLivesto																	
CPoultry																	
COthFish																	
CForest																	
CRiceMil																	
CAtaFlou																	
COthFood																	
CLeather																	
CJuteTex																	
CYarn																	
CMilClot																	
CCloth																	
CGarment																	
COthText																	
CTobP																	
CWoodP																	
CChem																	
CFerti																	
CPetroP																	
CClayP																	
CSteel																	
CMachin																	
CMiscInd																	
CUrbBuil																	
CRurBuil																	
CConst																	
CUtility																	
CTradeS																	
CTransS																	
CHous																	
CHealth																	
CEdu																	
CPubAdm																	
CFinS																	
COthS																	
CHotel																	
CComm																	
LEdu0M																	
LEdu1M																	
LEdu2M																	
LEdu3M																	
LEdu0F																	
LEdu1F																	
LEdu2F																	
LEdu3F																	
LAND																	
CAPITAL																	
Landless																	
Marginal																	
Small																	
Large																	
NARPF																	
NARPM																	
NARRF																	
NARRM																	
Illitera																	
LowEdu																	
MedEdu																	
HighEdu																	
CORP																	
ITAX	0.148				2.506	0.185	0.322	1.341	1.058		0.107	0.076	8.696	0.828	4.349	0.001	3.843
TAR			0.015	0.004	2.355			1.501	2.597		0.030	0.095	0.002	0.983	3.779	0.002	3.460
GOV																	
ROW			0.094	0.026	3.729	0.126	0.231	8.682	24.011		0.735	2.495	0.087	3.308	16.294	1.871	15.401
S-I																	
TOTAL	76.451	69.061	224.480	18.038	92.780	16.028	21.201	29.856	37.463	56.844	69.509	5.184	21.729	31.302	54.067	13.457	39.519

Appendix 8 (continued) - The 1993-94 social accounting matrix for Bangladesh

	CClayP	CSteel	CMachin	CMiscInd	CUrbBuil	CRurBuil	CConst	CUtility	CTradeS	CTransS	CHous	CHealth	CEdu	CPubAdm	CFinS	COthS	CHotel	CComm
APaddy1																		
APaddy2																		
AGrains																		
AJute																		
AComCrop																		
AOthCrop																		
ALivesto																		
APoultry																		
AOthFish																		
AForest																		
ARiceMil																		
AAtaFlou																		
AOthFood																		
ALeather																		
AJuteTex																		
AYarn																		
AMilClot																		
ACloth																		
AGarment																		
AOthText																		
ATobP																		
AWoodP																		
AChem																		
AFerti																		
APetroP																		
AClayP	10.967																	
ASteel		30.072																
AMachin			9.429															
AMiscInd				17.502														
AUrbBuil					48.900													
ARurBuil						153.453												
AConst							27.557											
AUtility								40.978										
ATradeS									266.909									
ATransS										250.515								
AHous											116.925							
AHealth												20.045						
AEdu													32.365					
APubAdm														46.081				
AFinS															118.037			
AOthS																54.291		
AHotel																	22.883	
AComm																		10.753
CPaddy																		
CGrains																		
CJute																		
CComCrop																		
COthCrop																		
CLivesto																		
CPoultry																		
COthFish																		
CForest																		
CRiceMil																		
CAtaFlou																		
COthFood																		
CLeather																		
CJuteTex																		
CYarn																		
CMilClot																		
CCloth																		
CGarment																		
COthText																		
CTobP																		
CWoodP																		
CChem																		
CFerti																		
CPetroP																		
CClayP																		
CSteel																		
CMachin																		
CMiscInd																		
CUrbBuil																		
CRurBuil																		
CConst																		
CUtility																		
CTradeS																		
CTransS																		
CHous																		
CHealth																		
CEdu																		
CPubAdm																		
CFinS																		
COthS																		
CHotel																		
CComm																		
LEdu0M																		
LEdu1M																		
LEdu2M																		
LEdu3M																		
LEdu0F																		
LEdu1F																		
LEdu2F																		
LEdu3F																		
LAND																		
CAPITAL																		
Landless																		
Marginal																		
Small																		
Large																		
NARPF																		
NARPM																		
NARRF																		
NARRM																		
Illitera																		
LowEdu																		
MedEdu																		
HighEdu																		
CORP																		
ITAX	1.584	3.007	4.960	1.378				5.825	0.263	0.004		0.003	0.015	0.099	0.612		0.229	0.621
TAR	1.279	3.270	6.249	2.703														
GOV																		
ROW	8.397	18.270	33.467	7.415														
S-I																		
TOTAL	22.227	54.619	54.105	28.998	48.900	153.453	27.557	46.803	267.172	250.519	116.925	20.049	32.380	46.180	118.649	54.291	23.113	11.375

Appendix 8 (continued) - The 1993-94 social accounting matrix for Bangladesh

	LEdu0M	LEdu1M	LEdu2M	LEdu3M	LEdu0F	LEdu1F	LEdu2F	LEdu3F	LAND	CAPITAL	Landless	Marginal	Small	Large	NARPF	NARPM	NARRF
APaddy1																	
APaddy2																	
AGrains																	
AJute																	
AComCrop																	
AOthCrop																	
ALivesto																	
APoultry																	
AOthFish																	
AForest																	
ARiceMil																	
AAtaFlou																	
AOthFood																	
ALeather																	
AJuteTex																	
AYarn																	
AMilClot																	
ACloth																	
AGarment																	
AOthText																	
ATobP																	
AWoodP																	
AChem																	
AFerti																	
APetroP																	
AClayP																	
ASteel																	
AMachin																	
AMiscInd																	
AUrbBuil																	
ARurBuil																	
AConst																	
AUtility																	
ATradeS																	
ATransS																	
AHous																	
AHealth																	
AEdu																	
APubAdm																	
AFinS																	
AOthS																	
AHotel																	
AComm																	
CPaddy																	
CGrains											0.001	0.015	0.037	0.037	0.002	0.021	0.001
CJute												0.009	0.021	0.021	0.001	0.012	0.000
CComCrop											0.297	1.686	1.336	0.950	0.465	1.255	0.202
COthCrop											0.091	2.117	8.566	9.896	0.164	4.155	0.064
CLivesto											0.071	1.083	2.646	4.433	0.211	2.626	0.089
CPoultry											0.030	0.473	1.172	1.970	0.089	1.155	0.038
COthFish											0.250	3.693	9.222	9.751	0.564	6.739	0.239
CForest											0.321	3.709	7.487	6.256	0.440	5.469	0.186
CRiceMil											3.788	27.661	36.802	19.606	3.333	35.717	1.485
CAtaFlou											0.094	1.080	1.695	0.974	0.108	1.445	0.045
COthFood											0.187	3.017	9.190	11.524	0.448	5.968	0.189
CLeather											0.007	0.087	0.408	0.554	0.019	0.357	0.008
CJuteTex											0.022	0.320	0.876	1.030	0.046	0.682	0.020
CYarn															0.000		0.000
CMilClot											0.041	0.348	0.497	0.472	0.083	0.489	0.036
CCloth											0.226	2.875	7.117	8.088	0.464	5.756	0.196
CGarment											0.037	0.462	1.227	1.401	0.077	0.987	0.033
COthText												0.005	0.002		0.001	0.004	0.000
CTobP											0.166	1.903	3.803	3.307	0.228	2.725	0.097
CWoodP											0.011	0.080	0.245	0.309	0.026	0.211	0.011
CChem											0.052	0.625	1.295	1.329	0.118	1.147	0.051
CFerti																	
CPetroP											0.038	0.411	0.849	0.710	0.099	0.922	0.042
CClayP											0.011	0.112	0.776	1.612	0.038	0.374	0.016
CSteel												0.001	0.006	0.007	0.000	0.006	0.000
CMachin											0.004	0.035	0.091	0.149	0.012	0.098	0.005
CMiscInd											0.003	0.036	0.144	0.318	0.011	0.138	0.005
CUrbBuil																	
CRurBuil																	
CConst																	
CUtility											0.019	0.229	0.610	0.547	0.049	0.615	0.021
CTradeS																	
CTransS											0.184	2.638	10.389	15.822	1.039	13.706	0.438
CHous											0.193	3.002	7.956	12.004	0.539	6.820	0.228
CHealth											0.050	0.467	1.589	3.030	0.111	1.387	0.046
CEdu											0.016	0.232	0.960	1.813	0.095	1.204	0.040
CPubAdm											0.002	0.025	0.055	0.072	0.004	0.051	0.002
CFinS											0.377	4.304	9.901	12.729	0.680	9.099	0.287
COthS											0.177	2.012	4.590	5.884	0.320	4.230	0.135
CHotel											0.101	0.920	2.203	1.956	0.237	3.220	0.100
CComm											0.002	0.020	0.044	0.057	0.003	0.041	0.001
LEdu0M																	
LEdu1M																	
LEdu2M																	
LEdu3M																	
LEdu0F																	
LEdu1F																	
LEdu2F																	
LEdu3F																	
LAND																	
CAPITAL																	
Landless	3.721	1.079	0.307		0.580	0.121								0.011			0.000
Marginal	36.841	15.228	5.048	0.936	6.767	1.785	0.386	0.174						0.002			0.000
Small	26.261	22.298	13.765	7.557	5.855	3.475	1.288	0.941	56.656		0.002	0.004		0.154			0.002
Large	10.524	11.242	13.493	11.127	2.614	2.194	1.479	1.012	104.056								0.000
NARPF	0.561	0.428	0.196	0.162	1.275	0.215	0.079	0.184									
NARPM	23.021	20.054	11.067	7.876	4.073	2.225	0.895	0.401									
NARRF	0.098		0.029	0.217	0.111	0.043		0.079									
NARRM	5.040	10.427	10.427	19.396	1.370	1.834	1.419	1.505									
Illitera	26.998	5.603	2.976	1.512	3.642	0.798	0.359	0.109			0.011	0.016	0.055	2.480			0.010
LowEdu	1.009	27.625	4.840	2.744	0.720	1.939	0.358	0.395			0.042	0.056	0.085	4.471			0.028
MedEdu	0.182	1.265	32.282	5.162	0.404	0.635	1.178	0.519									
HighEdu	0.252	0.776	2.530	74.208	1.060	0.536	0.919	6.119									
CORP										542.143							
ITAX																	
TAR																	
GOV														1.564	1.742		
ROW																	
S-I												1.460	12.112	26.380			3.598
TOTAL	134.506	116.025	96.961	130.896	28.471	15.800	8.360	11.439	160.711	542.143	6.926	67.227	147.622	173.859	10.124	118.833	7.998

Appendix 8 (continued) - The 1993-94 social accounting matrix for Bangladesh

	NARRM	Illitera	LowEdu	MedEdu	HighEdu	CORP	ITAX	TAR	GOV	ROW	S-I	TOTAL
APaddy1												85.013
APaddy2												108.053
AGrains												9.409
AJute												10.638
AComCrop												19.528
AOthCrop												86.389
ALivesto												68.573
APoultry												17.524
AOthFish												76.302
AForest												69.061
ARiceMil												224.371
AAtaFlou												18.009
AOthFood												84.189
ALeather												15.717
AJuteTex												20.648
AYarn												18.332
AMilClot												9.796
ACloth												56.844
AGarment												68.637
AOthText												2.519
ATobP												12.945
AWoodP												26.182
AChem												29.645
AFerti												11.583
APetroP												16.816
AClayP												10.967
ASteel												30.072
AMachin												9.429
AMiscInd												17.502
AUrbBuil												48.900
ARurBuil												153.453
AConst												27.557
AUtility												40.978
ATradeS												266.909
ATransS												250.515
AHous												116.925
AHealth												20.045
AEdu												32.365
APubAdm												46.081
AFinS												118.037
AOthS												54.291
AHotel												22.883
AComm												10.753
CPaddy												193.066
CGrains	0.014	0.009	0.011	0.014	0.016							14.099
CJute	0.008	0.005	0.006	0.008	0.010							10.638
CComCrop	1.076	1.114	0.999	0.412	0.029					0.001		26.581
COthCrop	2.231	1.108	1.725	3.630	14.209					0.321		88.462
CLivesto	1.635	1.395	2.596	4.696	10.222					0.090		69.980
CPoultry	0.717	0.606	1.133	2.086	4.716							17.534
COthFish	4.231	2.785	3.667	5.524	8.042					7.634		76.451
CForest	3.404	2.221	2.297	2.410	1.708							69.061
CRiceMil	21.434	17.608	15.643	19.875	16.476					0.005		224.480
CAtaFlou	0.887	0.564	0.647	0.805	1.019							18.038
COthFood	3.662	2.633	3.587	6.376	12.509					4.815		92.780
CLeather	0.210	0.127	0.233	0.529	1.722					10.906		16.028
CJuteTex	0.415	0.266	0.437	0.776	1.869					10.947		21.201
CYarn										0.124		29.856
CMilClot	0.357	0.312	0.401	0.352	0.173					0.024		37.463
CCloth	3.585	2.419	3.828	6.053	11.348							56.844
CGarment	0.589	0.395	0.629	1.052	2.039					60.072		69.509
COthText	0.004	0.005	0.005							0.950		5.184
CTobP	1.711	1.106	1.591	2.264	2.587					0.002		21.729
CWoodP	0.144	0.073	0.087	0.231	0.194					0.008	7.048	31.302
CChem	0.754	0.610	0.874	1.065	1.227					0.196		54.067
CFerti										0.720		13.457
CPetroP	0.611	1.017	1.619	2.482	3.064					0.319		39.519
CClayP	0.246	0.155	0.274	0.271	0.520					0.227		22.227
CSteel	0.004	0.002	0.004	0.005						0.068	9.478	54.619
CMachin	0.069	0.048	0.078	0.111	0.143					0.417	22.587	54.105
CMiscInd	0.087	0.050	0.096	0.214	0.793					0.892		28.998
CUrbBuil											35.826	48.900
CRurBuil											143.957	153.453
CConst											26.874	27.557
CUtility	0.376	0.579	0.994	1.893	3.794							46.803
CTradeS												267.172
CTransS	8.423	6.169	9.416	20.710	81.045							250.519
CHous	4.229	4.160	7.807	12.251	36.277							116.925
CHealth	0.864	0.575	0.773	1.688	2.546				6.491			20.049
CEdu	0.750	0.357	0.989	2.285	5.534				18.059			32.380
CPubAdm	0.033	0.024	0.038	0.068	0.166				32.587			46.180
CFinS	5.577	4.025	6.568	11.759	29.809							118.649
COthS	2.600	1.883	3.063	5.436	13.506							54.291
CHotel	1.969	2.187	2.064	2.058	4.852							23.113
CComm	0.026	0.019	0.030	0.054	0.163							11.375
LEdu0M												134.506
LEdu1M												116.025
LEdu2M												96.961
LEdu3M												130.896
LEdu0F												28.471
LEdu1F												15.800
LEdu2F												8.360
LEdu3F												11.439
LAND												160.711
CAPITAL												542.143
Landless	0.001			0.520	0.587							6.926
Marginal	0.000			0.036	0.023							67.227
Small	0.015			0.327	0.214	6.907			0.640	1.262		147.622
Large	0.002			0.088	0.096	12.673			1.134	2.231		173.859
NARPF				0.007	0.004	6.422			0.198	0.391		10.124
NARPM				0.050	0.030	45.084			1.359	2.699		118.833
NARRF				0.008	0.005	6.755			0.219	0.431		7.998
NARRM				0.047	0.029	40.688			1.288	2.545		96.015
Illitera	0.063			4.321	6.055				1.818	1.139		57.968
LowEdu	0.170	1.354		11.203	5.872	23.051			0.803	1.596		88.363
MedEdu					0.094	106.855			8.839	17.451		174.865
HighEdu						253.187			9.666	19.020		368.270
CORP												542.143
ITAX												42.156
TAR												29.246
GOV				1.743	3.071	15.772	42.156	29.246				95.294
ROW												158.856
S-I	22.834		14.154	37.077	79.862	24.748			12.193	11.352		245.770
TOTAL	96.015	57.968	88.363	174.865	368.270	542.143	42.156	29.246	95.294	158.856	245.770	

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