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A 2005 Social Accounting Matrix for Burkina Faso

**Lacina Balma
Dramane Bako
Barbi Kaboré**

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About the Authors

Lacina Balma is a consultant in Macroeconomic and Fiscal Management for the World Bank.

Dramane Bako is a statistician and works for the Partnership Development Agency at the prime minister office in Burkina Faso.

Barbi Kaboré is a statistician at the Institut National de la Statistique et de la Demographie, Burkina Faso

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Abstract

The 2005 Social Accounting Matrix (SAM) for Burkina Faso is an agricultural-focused SAM and, as such, it is mainly elaborated from the Agricultural Supply and Use Table (ASUT) for the same year. The matrix is then complemented with other sources of data including the 2005 National Supply and Use Table (NSUT), the 2005 Integrated Economic Accounts Table (IEAT), 2003 household survey data, and 2006-08 agricultural survey data. The SAM subsequently presents in its detailed structure 132 accounts of goods and services, of which 47 are agricultural products, and 74 accounts of activities. The factor account consists of three categories of agricultural workers and two types of capital, distinguishing between agricultural and non-agricultural capital. The accounts for the institutional units distinguish between four representative categories of households, one Government account, two accounts of financial and non-financial corporations, and one account of non-resident institutions or Rest of the world (ROW).

Résumé

La matrice de comptabilité sociale (MCS) de 2005 pour le Burkina Faso est une MCS à dominante agricole et, comme telle, principalement élaborée à partir du Tableau Ressources Emplois (TRE) agricole de la même année. La matrice est ensuite complétée par d'autres sources de données, y compris le TRE national et le tableau de comptes économiques intégrés (TCEI) de 2005, l'enquête ménages de 2003, et le enquêtes agricole 2006-2008. La MCS ainsi construite présente dans sa structure détaillée 132 comptes de biens et services, dont 47 sont des produits agricoles, et 74 comptes d'activités. Les comptes de facteurs se composent de trois catégories de travailleurs agricoles et deux types de capital-capital agricole et non agricole. Les comptes des unités institutionnelles comprennent quatre catégories représentatives des ménages, un compte du gouvernement, deux comptes des sociétés financières et non financières, et un compte d'institutions non-résidentes ou Reste du monde (ROW).

List of Abbreviations

DGPER	Direction Générale pour la Promotion de l'Economie Rurale
GDP	Gross Domestic Product
GFCF	Gross Fixed Capital Formation
IEAT	Integrated Economic Accounts Table
INSD	Institut National de la Statistique et de la Démographie
NAEMA	Nomenclature d'Activités des Etats Membres d'AFRISTAT
NOPEMA	Nomenclature de Produits des Etats Membres d'AFRISTAT
ROW	Rest of the World
SAM	Social Accounting Matrix
SCADD	Stratégie pour la Croissance Accélérée et pour le Développement Durable
SUT	Supply and Use Table

1. Background and Motivation

In recent decades, Burkina Faso has engaged in significant economic reforms with the support of the international community in a bid to face its financial and fiscal imbalances. These reforms have enabled Burkina Faso to record remarkable economic performances from 1991 to 1999, with an average annual growth rate of 5%. Despite considerable efforts toward achieving the Millennium Development Goals, however, the country's economic growth was not strong enough to bring about increases in human development indicators. This situation led the government to formulate a Poverty Reduction Strategy Paper (PRSP) in 2000, the implementation of which enabled the country to sustain economic growth of 3 to 6% per year between 2000 and 2006. However, the country's societal growth remains subdued, prompting the formulations of a new strategy in 2010 called the "Strategy for Accelerated Growth and Sustainable Development" (SCADD). SCADD is geared toward providing momentum to the previous PRSP and covers several key areas, including rural development.

The objective of the Burkina Faso's in this area is to strengthen food security by increasing agricultural production and raising the incomes of smallholder farmers. Therefore, there is need to better understand the role of the agricultural sector, as this is the primary sector of the economy. In 2005, the General Directorate for the Promotion of Rural Economy (DGPER) set up a cell whose mandate is to steer and monitor impact analysis of agricultural policies on food security and households' living conditions. Some analytical tools have been made available and include inter alia an agricultural supply and use table for 2000, a social accounting matrix for 2000, and an agricultural general equilibrium model. All of these were updated for 2005.

The 2005 SAM was put together by a team consisting of officials from the national accounting services of the Ministry of the Economy and Finances and from the General Directorate for the Promotion of Rural Economy. The team defined a methodological framework, collected data, and made refinements where necessary before building the SAM. The objective of this report is to present the methodological framework followed in building the SAM, as well as the data sources used.

The rest of the document is structured as follows. Section 2 is devoted to outlining the structure of the SAM and of the data issues. Section 3 exhibits the methodology followed in building the SAM, while Section 4 outlines the resultant SAM. In Section 5, we look at the challenges encountered; Section 6 concludes.

2. Presentation of the 2005 Social Accounting Matrix

2.1. Structure of the Macro-Sam

The 2005 Social Accounting Matrix has been guided by concerns expressed by the General Directorate for the Promotion of Rural Economy. The first concern included establishing a consistent macroeconomic framework which could be used for impact evaluation of public policies. The second concern consisted of creating a tool deemed adequate to address questions related to agricultural value

chains; this required disaggregating activities and products in the SAM as much as possible and paying more attention to the level of disaggregation of government income sources. Finally, concerns were put forth regarding the role of the government in the agricultural sector; therefore matrix needed to come with an appraisal of the impact of public investments on agricultural production as well as on other social sectors.

In order to account for these needs expressed by the government, the following components were emphasized while building the 2005 SAM:

- Highlighting all tiers of the agricultural value chain as long as data were available.
- Bringing out the income level of the first stakeholders in the agricultural sector, namely rural households compared to groups of urban households

The following accounts represent as close as possible the economy of Burkina Faso: the accounts of activities, of production factors, of institutional units, of investment and saving, and of rest of the world.

Table 1 outlines the structure of the macro-SAM

Table 1: Structure of the macro-SAM

		Factors	Institutions				Industries	Commodities
			Private institutions	Government	Rest of the world	Capital account		
Factors							Factors' compensation	
Institutions	Private institutions	Factors' income	Transfers incomes and payments				Taxes and levies on production	Imports, transaction taxes and levies
	Government							
	Rest of the world							
	Capital account							
Industries								Domestic supply
Commodities			Private final consumption, Government consumption, exports, fixed capital formation and changes in inventories				Intermediate consumption	

Source: Authors

2.1.1 Definition of the Nomenclatures

While building this SAM, we followed the reference harmonized system classification codes adopted by the member States of AFRISTAT. This harmonized system is based on the Classification of Industries of the Member States of AFRISTAT (NAEMA) and of the Classification of the Commodities of the Member States of AFRISTAT (NOPEMA).

2.1.1.1. The Accounts of Industries and Commodities (Goods and Services)

The construction of the SAM relied on the 2005 Agricultural Supply and Use Table (ASUT) without any alteration; this table covers in detail the agricultural value chain from production activities through

processing activities to commercialization. This initial nomenclature was then broadened to include the other industries in the economy in order to maintain the completeness of the SAM.

The accounts of commodities have been defined in such a way that they match the classification of the accounts of industries by aggregating the commodities by activities according to the NOPEMA and the NAEMA. Therefore, the account of industries exhibits 74 sectors, of which 48 agricultural sectors, broadly speaking, and 26 are other sectors of the economy.

2.1.1.2. The Production Factors

The structure of the production factors in this SAM did not change from those of the 2000 SAM.¹ We can distinguish between agricultural factors and non-agricultural factors as shown below.

Codes	Factors
F1	Agricultural labor compensation
F2	Non-agricultural labor compensation
F3	Self-employment compensation
F4	Agricultural net-operating surplus
F5	Non-agricultural net-operating surplus

Source: Authors

2.1.1.3. The Institutional Units

Some adjustments have been made to the 2000 SAM at the level of the institutional units. The sub-sectors of household, financial, and non-financial corporation have been reviewed and a fictitious sector has been added to account for the financial intermediation services indirectly measured (FISIM). Furthermore, the term “Public Administration” has been used in place of “Government,” as this sub-sector is quite broad and includes local governments (governorates, town halls), social security administrations, and other government tiers.

Codes	Institutional Sectors
I1	Rural poor households
I2	Urban poor households
I3	Rural non-poor households
I4	Urban non-poor households
I5	Non financial corporations
I6	Financial firms
I7	Public administrations
I8	Fictitious sector
ROW	Rest Of the World

Source: Authors

¹ Note that the present SAM stems from updates to the 2000 SAM.

2.2. Data Sources

2.2.1. The 2005 Agricultural Supply and Use Table

The 2005 ASUT was developed under the 2008 AI/CN-SISA project by the General Directorate for the Promotion of Rural Economy to update tools for the analysis of policy impacts of agricultural and rural development. It integrates the crop production, livestock production, forestry, fishing, and hunting sectors, as well as economic sectors that intervene in the processing and marketing of products from the primary sector. The ASUT is a balanced table of supply and use of the selected agricultural products; supply and use are balanced up to 2,360 billion CFA francs. Agricultural GDP is estimated at 1,359 billion CFA francs, which represents 47% of Burkina Faso's GDP (2,888 billion CFA francs). The table below provides a summary of the main components of the ASUT. It is worth mentioning that the 2005 ASUT was finalized in March 2009, before the completion of the 2005 National Accounts.

Table 2: Agricultural GDP (Million CFAF)

The components of the agricultural GDP	Total	%
Value Added	1 297 712	95%
Import taxes	34 358	3%
Export taxes	130	0%
Other indirect taxes	27 001	2%
Subsidies on products	0	0%
Total agricultural GDP	1 359 201	100%
Supply	Total	%
Production	2 145 135	91%
Imports	153 029	6%
Taxes on products	61 489	3%
Subsidies on products	0	0%
TOTAL	2 359 653	100%
Use	Total	%
Intermediate consumption	612 580	26%
Final Consumption	1 420 174	60%
GFCF	33 756	1%
Inventories	65 759	3%
Exports	227 384	10%
TOTAL	2 359 653	100%

Source : SAM

2.2.2. The National Accounts Data

The 2005 national accounts data was finalized in 2009; the Supply and Use Table (SUT) and the Integrated Economic Accounts Table (IEAT) was already available at this time. The SUT is used to account for sectors not covered by the ASUT. The IEAT serves to fill out the information related to the

institutional sectors and the ROW. In addition to the main national account tables, other sources of data were used to lay out in detail the flow of income and of capital between the institutional sectors.

Table 3: Structure of the 2005 Supply and Use Table (Million CFAF)

GDP at factor cost	2 605 499
Import taxes	130 791
Export taxes	322
Other indirect taxes	146 263
Subsidies on products	-1 470
GDP at market price	2 881 405
Final consumption	2 649 508
GFCF	567 285
Changes in inventories	127 012
Exports	280 764
Imports	-743 164
GDP at market price	2 881 405

Source : SAM

2.2.3. The 2003 Household Survey Data

The Burkina Faso's national household survey was conducted in 2003 by the National Institute of Statistics and Demography (INSD). This is the last household survey available that covered household expenses and incomes at the time of building this SAM. The incomes and expenses data allowed us to split the household sector as much as possible, as presented in Section 2.1.1.3.

2.2.4. The Agricultural Survey Data

The General Directorate for the Promotion of Rural Economy (DGPER) conducts a yearly permanent agricultural survey which allows it to assess the production of the agricultural campaign over each year. Further information on households and farming have been collected through the agricultural census conducted from 2006 to 2008. While this census data was not completed in time to be included in this SAM, the DGPER already had data on characteristics and household assets that were usable for the construction of the SAM.

3. Steps Followed in Building the Sam

Once all the required data are put together and the framework is duly set up, the next step consists of building the SAM. The following methodology was followed:

- Consolidating the national supply and use table and the agricultural supply and use table ;
- Filling out the table of the accounts of goods and services ;
- Filling out the table of production factors compensations ;
- Factoring in income distribution between institutional sectors ;
- Filling out the table of the intra-institutional income distribution ;

The next sections present an in-depth outline of this methodology.

3.1. Consolidation of the National Supply and Use Table and the Agricultural Supply and Use Table

With two supply and use tables, the first one pertaining specifically to the agricultural sector and the second one taking a national perspective, it was necessary to consolidate both tables into one single framework. The National Supply and Use table (NSUT) lays out the balance between supply and use of all products and groups of products throughout the whole economy, while the ASUT lays out the same balance in a detailed way for primary products and their derivatives.

The consolidated table allows us to paint an exhaustive picture of the national economy, as well as a detailed presentation of the balance between supply and use and the accounts of activity, goods, and services with a focus on agricultural sectors. It is balanced up to 4,956 billion CFA francs in the supply and use sides.

Table 4: Consolidated SUT

	Totals in million CFA F
Production	3,939,632
Imports	738,605
Taxes on products	279,084
- Subsidies on products	-1,470
TOTAL supply	4,955,851
Intermediate Consumption	1,464,297
Final Consumption	2,594,090
GFCF	548,195
Inventories	65,934
Exports	283,337
TOTAL use	4,955,851

Source : SAM

3.2. Filling out the table of the accounts of goods and services

The consolidated SUT allows us to fill out the table of the accounts of goods and services. The account of industries, the intermediate consumption table, trade margins, final consumption, investment (GFCF+ inventories), exports, imports, and taxes net of subsidies on products stem from the consolidated table as well. However, it is worth mentioning that the distribution of the final consumption between households and groups of households (rural poor, urban poor, rural non-poor, and urban non-poor) stems from budget shares taken from the 2003 households' survey data.

3.3. Filling out the table of production factors compensations

The value added is distributed between labor and capital after deduction of taxes net of subsidies on operating surplus. Then each sectoral value added is obtained from subtracting the other taxes net of subsidies on production. As for the labor factor compensations and the other taxes on production, the information stems from the consolidated table.

It is important to mention that for the agricultural sectors, all the compensations are allocated to the agricultural labor inputs in the SUT. The remaining value added is then distributed between self-employment and agricultural capital. The agricultural net operating surplus is estimated using the ratio of consumption of fix capital to value added. Then it is straightforward to estimate self-employment by deduction.

Table 5: Share of agricultural capital in gross value added (in %)

Industries	Consumption of fix capital / gross VA
Millet	2.5%
Sorghum	2.0%
Maiz	1.2%
Rice	1.3%
Fonio	1.5%
Vegetables	0.1%
Tubercles	0.4%
Peanut	1.8%
Other oilseeds	0.4%
Cotton	2.0%
Fruits	0.1%
Gardening	2.5%
Other vegetables	2.5%

Source : DGPER

The 2003 household survey data finds that 98.3% of labor in the livestock sector is compensated. This means that the compensation of labor in the livestock sector represent 98.3% of the total income from the agricultural labor factor income, including self-employment. Therefore, by deduction, self-employment in this sector represents 1.7% of the total labor income. The net operating surplus is obtained by balance once the earned labor and self-employment are estimated.

3.4. Distributing factor income between institutional sectors

Using the 2003 household survey data, it is possible to figure out the relative shares of each household group's income related to each type of income. These shares were then used to break down factor income among household groups.

Table 6: Rates of labor compensation by type of labor

	F1-Earned agricultural labor	F2-Non-agricultural labor	F3-self-employment
Rural poor households	30%	2%	30%
Urban poor households	1%	3%	1%
Rural non-poor households	65%	17%	65%
Urban non-poor households	4%	78%	4%
Total	100%	100%	100%

Source: 2003 household survey and authors' calculations

Regarding non-agricultural capital, data from the integrated economic account table provide the shares for non-financial corporations, financial corporations, and the government, respectively. The fictitious sector receives the counterpart of financial intermediation services (FISIM). The capital return attributable to non-agricultural households is obtained by balance before being distributed between different groups of households by the following shares obtained in the 2003 Households survey data.

Table 7 : Distribution of Capital Income

	41-Agricultural capital	F5-Non-agricultural capital
Rural poor households	30%	15%
Urban poor households	1%	4%
Rural non-poor households	65%	35%
Urban non-poor households	4%	46%
Total	100%	100%

Source: 2003 household survey and authors' calculations

3.5. Distribution of the intra-institutional income

To better track revenue flows between institutional sectors, we built the sub-matrices of “which to whom” on the basis of the national accounts. Four main sub-matrices were constructed following the four operations below:

- Property income (D4) ;
- Income taxes (D5) ;
- Contributions and social benefits (D6) ;

- Other current transfers (D7).

Table 8 traces the flow of income between different institutional sectors.

Table 8: Distribution of the intra-institutional income (Million CFAF)

	Non-finacial corporations	Financial corporations	Public administrations	Households	ROW
Property income					
Non-financial corporations		10,499			9,519
Financial corporations	34,424		6,715	20,638	6,748
Public administrations	9,532	6,864			
Households	22,725	13,561			
ROW	8,605	3,132	2,3477		
Income taxes					
Public administration	56,810	5,713		27,594	
Contributions and social benefits					
Public administration				39,627	
Households			22,047		
Other current transfers					
Non-financial corporations		1,844	3,093.5		
Financial corporations	1,844		1,872	1,977	1,443
Public administrations	9,657	2,485		266	224,965
Households	8,175	5,569	131,583		26,097
ROW			12,278	36,810	

Source: SAM

3.6. The account of Savings

The account of savings puts together all savings from institutional sectors (households, government, and rest of the world) necessary for sectors in quest for funding sources. For the rest of the world, the account of savings represents its current account balance,² which is its ability to invest abroad if it is positive or its inability to invest if it is negative; in this latter case, it must resort to foreign savings. This account received the greatest adjustment to allow the balance between resources (income) and uses (expenditures).

² Actually the negative of the Current Account Balance

4. Presentation of the 2005 Sam

The SAM presents 132 accounts of goods and services, of which 47 are agricultural products, and 74 accounts of activities. The factor account consists of three categories of agricultural workers and two types of capital, distinguishing between agricultural and non-agricultural capital. The accounts for the institutional units distinguish between four representative categories of households, one Government account, two accounts of financial and non-financial corporations, and one account of non-resident institutions or rest of the world.

5. Difficulties

The construction of this SAM was quite challenging. Technical issues we encountered are related to a highly aggregated data at the industry and commodities levels. To address this issue and provide a more detailed table, we used the ERETES³ database and then adjusted it to match the required format of the SAM.

Other challenges inherent to this work include inter alia the non-availability of capital spending by destination, which made it difficult to track investment spending (irrigation schemes, support to the producers, technical assistance, etc.) in the agricultural sector.

6. Conclusion

This report has documented the 2005 SAM for Burkina Faso. The task was conducted using a two-step process. The first step consisted of pinning down the methodological framework and gathering the required data. The second step consisted of building the SAM itself. In its detailed form, the SAM has 132 accounts of goods and services, of which 47 are agricultural products, and 74 accounts of activities. The factor account consists of three categories of agricultural workers and two types of capital distinguishing between agricultural and non-agricultural capital. The accounts for the institutional units distinguish between four representative categories of households, one Government account, two accounts of financial and non-financial corporations, and one account of non-resident institutions or rest of the world.

³ Computerized tool for the development of national accounts

- The 2005 Macro-SAM (Million CFAF)

	Commodities	Industries	Labor Factors					Institutional Units							S-I	ROW	Total
	<i>P</i>	<i>A</i>	<i>F1</i>	<i>F2</i>	<i>F3</i>	<i>F4</i>	<i>F5</i>	<i>I1</i>	<i>I2</i>	<i>I3</i>	<i>I4</i>	<i>I5</i>	<i>I6</i>	<i>I7</i>			
P		1,464,297						342,256	32,340	998,598	651,258			569,637	614,128	283,337	4,955,851
A	3,939,632																3,939,632
F1		73,333															73,333
F2		553,255															553,255
F3		484,527															484,527
F4		264,012															264,012
F5		1,094,892															1,094,892
I1			22,000	11,065	145,358	54,204	67,876		80	20,643	13,419	1,236	765	21,947		3,654	362,246
I2			733	5,793	4,845	2,640	10,885	104		2,359	1,533	1,854	1,148	4,703		783	37,381
I3			47,666	197,855	314,942	196,608	257,192	2,133	187		31,335	3,399	2,104	54,868		11,222	1,119,510
I4			2,933	338,542	19,381	10,560	286,182	1,562	137	35,308		24,411	15,113	72,112		10,439	816,679
I5							296,133						12,343	3,094		9,519	321,089
I6							36,349	452	678	3,845	17,640	36,268		8,587		8,191	112,010
I7	277,614	5,317					178,680	1,350	2,025	11,473	52,640	75,999	15,062			224,965	845,125
I8							-38,405						38,405				0
E/I								13,652	830	41,028	20,142	169,317	23,938	74,423		270,798	614,128
RDM	738,605							736	1,104	6,258	28,712	8,605	3,132	35,755			822,907
Total	4,955,851	3,939,632	73,333	553,255	484,527	264,012	1,094,892	362,246	37,381	1,119,510	816,679	321,089	112,010	845,125	614,128	822,907	16,416,578

Total Col.	4,955,851	3,939,632	73,333	553,255	484,527	264,012	1,094,892	362,246	37,381	1,119,510	816,679	321,089	112,010	845,125	614,128	822,907	16,416,578
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