Senegal 1996 SAM converted to GTAP format

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Senegal, on the western tip of Africa, is economically in the middle rank of African countries. Important industries include fishing, fish processing, peanuts and phospate mining. Energy sources are biomass (firewood) and imported oil. There is (in 2001) no coal or oil production. Subsidized rice from the USA has replaced millet as the staple food. Extensive port facilities at Dakar, the capital, serve Senegal and neighbouring countries such as Mali. The population is about 11 million.

The data source was a 1996 SAM prepared by Dr Mamadou Dansokho and Amadou Diouf in 1999 for the Senegal government. The SAM was supplied by Patrick Osakwe, of the Trade and Regional Integration Division, UN Economic Commission for Africa (UNECA). Conversion of IO data to GTAP format was performed by Mark Horridge and funded by UNECA through the African Trade Policy Centre.

Some features of the SAM are:

- 33 sectors (see Table 1, Col xxx) with a diagonal MAKE.
- 15 household types
- Commodity flows are measured in purchasers' values (reconciled to producers' values via a vector of margins produced by a Commerce sector) and include both domestic and imported use.
- an accumulation column included investment and inventory use, perhaps errors as well
- an imports vector
- a single vector of sectoral taxes
- remarkably large "own-use" entries; eg, use of paper by paper industry
- documentation in French

The GTAP format requires separate full matrices of basic and tax components for each of domestic and imported goods. To produce these from the SAM we:

- reduced most "own-use" by a factor of 5.
- prorated the margins vector over users and reallocated them to direct use.
- for the accumulation column, treated positive flows of non-agricultural goods as investment use; the remainder as inventory changes.
- prorated the tax vector over users to produce separate basic and tax matrices. We assumed that exports and inventories paid no tax, and that household usage was taxed more heavily.
- prorated the imports vector over non-export users to produce separate imported and domestic basic use matrices. The tax matrix was split using the basic imp/dom shares, and assuming imported goods were taxed more heavily than domestic.
- aggregated sectoral detail which exceeded GTAP's 57 good system.
- added an infinitesimally small coal sector (neither produced nor used in Senegal).
- split Mining sector into OilGas and OtherMining, by assuming that nearly all mining imports were OilGas, and that these were used by the Refining sector.
- uniformly scaled the original values measured in milliard francs CFA to conform with the 2001 US$ GDP estimate used by Purdue.

The result was a 30-sector IO table of the format required by Purdue. Table 1 shows the mapping from these 30 sectors to the 33 original sectors and to the 57 GTAP sectors.

Table 1: Mapping between SAM and GTAP sectors

33 original SAM sectors		30 intermediate sectors	57 GTAP sectors
MilSorgho	1	MilSorgho	gro
Riz	2	Riz	pdr
Peanut	3	OilSeed	osd
RootCrop Legumes Fruits	4	VegFruit	v_f
Coton	5	Coton	pfb
LiveStock	6	LiveStock	ctl oap rmk wol wht
AutrAgric	7	AutrAgric	c_b ocr
Forestry	8	Forestry	for
FishingLg FishingSm	9	Fishing	fsh
	10	Coal	col
Mining	11	OilGas	oil gas
	12	Mining	omn
FatsOils	13	FatsOils	vol
GrainMill	14	GrainMill	pcr
FishProds OthFoodPrd	15	OtherFood	cmt omt mil sgr ofd b_t
Textile	16	Textile	tex wap lea
WoodPrd	17	WoodPrd	lum
PaperPrd	18	PaperPrd	ppp
PetrolRn	19	PetrolRn	p_c
OthChem	20	OthChem	crp
CnstMatrl	21	CnstMatrl	nmm
MetalMecan	22	MetalMecan	i_s nfm fmp mvh otn ele ome omf
Energie	23	Energie	ely gdt
Constructn	24	Constructn	cns
HotelRest Commerce	25	Trade	trd
Transport	26	Transport	otp wtp atp
PostTelecm	27	PostTelecm	cmn
Finance	28	Finance	ofi isr
PubAdmin	29	PubAdmin	wtr osg
OthService	30	OthService	obs ros dwe

References:

Dr Mamadou Dansokho, Amadou DIOUF: *Elaboration de Matrices de Comptabilite Sociale de l'Economie Senegalaise pour les Annees 1992 et 1996*, Ministère de l'Economie, des Finances et du Plan, Novembre 1999, Dakar