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Intergovernmental Transfers in Sudan:
A Proposed Approach for Horizontal Distribution[1]

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I. Introduction:

[1] This paper is written for Unicons Consultancy Ltd and the FFAMC, Khartoum. Sudan. It is to be presented at the workshop entitled "Fiscal Federalism in Sudan" (20th June, 2007) that is being jointly organized by Unicons and the FFAMC and sponsored by the World Bank.

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According to the Interim National Constitution of the Republic of Sudan (INC) the "overarching aims of economic development shall be the eradication of poverty, attainment of the Millennium Development Goals, guaranteeing the equitable distribution of wealth, redressing imbalances of income and achieving a decent standard of life for all citizens" (article 10 (1)). These aims are to be achieved in he context of "a decentralized State with the following levels (a) The national level of government, (b) Southern Sudan level, which shall exercise authority in respect of the people and **states** in Southern Sudan, (c) The state level of government, which shall exercise authority at the states throughout the Sudan and render public services through the level closest to the people, (d) Local level of government, which shall be throughout the Sudan" (article 24). One of the principles of inter-governmental linkages that is to be respected in the administration of the decentralized system is that "the linkage between the **national level** and the **states in Southern Sudan** shall be through the **government of Southern Sudan**" (article 25 (a); emphasis is not in the original).

Within the context of the decentralized system of government, and the desired linkages between various levels of government, the INC provided guiding principles for the equitable sharing of resources and common wealth. Among these principles are that " (1) resources and common wealth of the Sudan shall be shared equitably to enable each level of government to discharge its legal and constitutional responsibilities and duties and to ensure that the quality of life, dignity and living conditions of all citizens are promoted without discrimination on grounds of gender, race, religion, political affiliation, ethnicity, language or region. (2) The sharing and allocation of the resources and common wealth of the Sudan shall be based on the premise that all parts of the country are entitled to development. (3) The National Government shall fulfill its obligations to provide financial transfers to the Government of Southern Sudan, and shall, except as otherwise provided herein, apportion revenues among other states.. ….(6) Revenue sharing shall reflect a commitment to devolution of powers and decentralization of decision making in regard to development, service delivery and governance…. (11) No level of government shall withhold any allocation or financial transfers due to any other level of government" (article 185).

In the INC, the sources of national revenue, Southern Sudan revenue, and states revenue, are respectively regulated by articles 193, 194, and 195. Article 192 deals with the sharing of oil revenue. In this respect it is important to note that the allocation of Southern Sudan non-oil revenue is regulated by article 196 which states that "(1) Notwithstanding the provisions of Articles 192, 193, and 194 herein, the National Government shall allocate fifty percent of the national non-oil revenue collected in Southern Sudan, as provided for under Article 193 above, to the Government of Southern Sudan to partially meet the development costs during the interim period. (2) The Government of Southern Sudan and states shall retain and dispose of such other income raised and collected under their taxing powers".

The INC created a special commission, the Fiscal and Financial Allocation and Monitoring Commission (FFAMC), to "**ensure the transparency and fairness in regard to the allocation of nationally collected funds to the Government of Southern Sudan and the state**s" (article 198). In this respect all "revenues collected nationally for or by the National Government shall be pooled in a National Revenue Fund administered by the National Treasury. Such Fund shall embrace all accounts and sub-funds, into which monies due to the Government are collected, reported and deposited" (article 197).

The duties and responsibilities of the FFAMC are enumerated in article (198-2) as "(a) monitor and ensure that **equalization grants from the National Revenue Fund** are promptly transferred to respective levels of government, (b) guarantee appropriate utilization and sharing of financial resources, (c) ensure that revenues allocated to conflict affected areas are transferred in

accordance with agreed formula, (d) **safeguard transparency and fairness in the allocation of funds to the Government of Southern Sudan and the states according to established ratios or percentages stipulated in this Constitution**" (emphasis is not in the original).

Having noted the above, the rest of this note is organized in two parts. The first part consists of the following: Section (II) provides some background information needed to indirectly estimate GDP at State level; section (III) provides information on the current system of transfers to Northern states with emphasis on 2005. Section (IV) presents the results of applying the proposed methodology while section (V) concludes.

The second part of the paper, given in the form of annexes 1-3, provides the theoretical underpinnings and the methodology adopted to reach the presented results. As such, Annex (1) outlines the standard framework used in the relevant literature on intergovernmental transfers. Annex (2) gives the methodology adopted to develop a transparent mechanism for the allocation of equalization grants. Annex (3) provides the proposed formula that is applied to estimate GDP at State level.

II. Some Background Information:

2.1. GDP at the State Level:

As is probably well known there is a serious data problem in Sudan, especially with respect to information regarding GDP at the level of states. Recent efforts by UNICEF, the World Bank, the IMF and UNDP have improved our knowledge, but a lot of noise in the data sets compiled by these organizations still exists. As a result resort to indirect methods of estimation is inevitable. Such a method of estimation, shown in Annex 3 of the paper, is used to estimate GDP produced by the various states; and no claim to absolute accuracy is made.

According to the IMF (2007: 20, table 2) GDP in 2005 is estimated as amounting to about 6748 billion Sudanese Dinars (approximately US$27699 million). With a total population of 35.4 million this gives a per capita GDP for the country of about 190.6 thousand Dinars (US$783, using an exchange rate of 243.6 Sudanese Dinars to a US$ as per the IMF). According to UNDP (2006) GDP per capita for Sudan in 2004 is estimated in PPP as US$1949, corresponding to 161536 Sudanese Dinars and implying a conversion factor of 82.9 Sudanese Dinars to one US$ in PPP. Using this conversion factor GDP per capita for 2005 would be US$2299 in PPP.

By a repeated use, and adjustment of the results, of the estimated equation [equation (15) in Annex 3] and the population figures for 2005 we arrived at the estimates for GDP in the northern states as per table (1).

Table (1):
Estimates of GDP for the Northern States: 2005

State	IMR (per thousand live births)	Per Capita GDP (US$ PPP)	Per Capita GDP (Sudanese dinar)	Population (thousand)	GDP (billion Sudanese dinar)
Northern	60	2791	231375	636.48	147.3
Nile	62	2747	227775	991.44	225.8
Red Sea	100	2186	181220	748.68	135.7
Kassala	70	2592	214930	1657.50	356.3
Gedarif	106	2125	176239	1707.48	300.9
Gezira	65	2686	222684	3872.94	862.5
Sinnar	95	2240	185721	1327.02	246.5
White Nile	80	2432	201632	1668.72	336.5
Blue Nile	126	1957	162256	730.32	118.5
Khartoum	65	2686	222684	5664.06	1261.3
N. Kordofan	70	2592	214930	1609.56	345.9
S. Kordofan	93	2263	187621	1197.48	224.7
N. Darfur	75	2508	207953	1688.10	351.0
S. Darfur	84	2376	196981	3234.42	637.1

W. Darfur	95	2240	185721	1768.68	328.5
Total/Average	90*	2299*	190622*	28502.88	6748*

* For the Sudan as a whole.

The table, we suggest, presents reasonable estimates that can further be refined to respect an additivity requirement for the whole of the country, including taking into consideration the contribution of oil to GDP. For illustrative purposes, however, the results confirm the dominating position of Khartoum state in the economy of the country. In the standard framework that uses standardized expenditure and tax ratios the results can be used to generate alternative transfer allocation mechanisms.

2.2. The Human Development Index:

In addressing issues of transparency and fairness in the allocation of federal transfers to sub-national governments, it is usual to search for a reference indicator of development performance. According to the CPA such reference indicator is specified as follows: "**Southern Sudan and those areas in need of construction/reconstruction, shall be brought up to the same average social/economic standard and public services as the Northern States**". This suggests that special weights for deprivation in all social services can be anchored on the average level of social achievements of the Northern States. A relevant, and an MDG consistent, anchor is the Human Development Index. For the various Northern States we computed HDI as per table (2) below. Four indicators are used in the calculation of the HDI: infant mortality rate (denoted IMR; with the Red Sea state recording the worst performance of 116 per thousand; and, Al-Gezira recording the best performance of 43 per thousand); under-5 mortality rate (denoted U5-MR; with Blue Nile recording the worst performance of 172 per thousand; and Al-Gezira recording the best performance of 59 per thousand); life expectancy at birth (denoted LEB; with Blue Nile recording the worst performance of 50.1 years; and Al-Gezira recording the best performance of 58.5 years); and the school enrolment ratio (denoted SER; with Western Darfur recording the worst performance of 21.5 percent; and Northern recording the best performance of 88 percent).

Table (2):

Human Development Index for Northern States

State	IMR Indicator	U-5 MR Indicator	LiEB Indicator	SER Indicator	HDI
Northern	0.8219	0.8319	0.2500	1.0000	0.7259
Nile	0.8082	0.8053	0.9286	0.8632	0.8513
Red Sea	0.0000	0.0619	0.1313	0.3519	0.1362
Kassala	0.2055	0.2124	0.5219	0.2406	0.2956
Gedarif	0.6712	0.4867	0.1786	0.3639	0.4251
Gezira	1.0000	1.0000	1.0000	0.9053	0.9763
Sinnar	0.8904	0.6549	0.5000	0.4977	0.6358
White Nile	0.6301	0.5398	0.7143	0.8226	0.6767
Blue Nile	0.2055	0.0000	0.0000	0.1895	0.0987
Khartoum	0.6438	0.6106	0.9405	0.9218	0.7792
N. Kordofan	0.7671	0.6903	0.5119	0.3774	0.5867

S. Kordofan	0.2877	0.2212	0.6071	0.1970	0.3283
N. Darfur	0.7534	0.6283	0.6786	0.9609	0.7553
S. Darfur	0.7123	0.6726	0.5119	0.2466	0.5359
W. Darfur	0.6164	0.6018	0.5714	0.0000	0.4474

On the basis of the above table the average achievement by states in Northern Sudan relating to health and education, the two most important dimensions of human development, is represented by an average HDI of 0.5888. Given the CPA guiding principle it is suggested that states achieving less than this average be accorded a commensurate weight to reflect their deprivation. Prior to the current Darfur conflict (which started in 2003) the states in question include the Blue Nile, Red Sea, Kassala, Southern Kordofan, Gedarif, Western Darfur, Western Kordofan, and Southern Darfur. We suggest that this identification concurs with our intuitive understanding of regional development marginalization. Needless to note, however, that the HDI could easily be re-calculated at any point in time to reflect the realities on the ground given the availability of data.

III. The Expenditure and Revenue System:

3.1. Current Expenditure:

Until very recently, and despite the decentralization trends in the governance structure of the country, very little detailed statistical knowledge was available regarding the state of expenditure at the level of the Northern States. This is especially true for the functional distribution of whatever observed total expenditure incurred at this level of government. Recently, however, UNICONS Consultancy was able to undertake a compilation exercise, using official State-level data from the Ministry of Finance and National Economy. The compilation is done over the period 2000-2005.

In the original compilation total public expenditure at the level of the state is classified into (a) current expenditure (composed of wages and salaries and goods and services); (b) investment and capital contribution; and (c) development expenditure. Under each item (or possibly chapter) a distinction is made between Ministries and localities in each state. Such classification, we hasten to note, is not the same as that required to reflect functional classification.

Table (3) reports total public expenditure at the level of the states over the period 2000-2005 where the figures between brackets are the share of current expenditure in total expenditure.

Table (3):
Total Expenditure and the Share of Current Expenditure at the Level of Northern States (billion dinars and %)

State	2000	2001	2002	2003	2004	2005
Northern	2.3 (95.8)	3.2 (99.0)	3.5 (96.5)	4.6 (96.7)	9.4 (78.6)	12.9 (75.8)
Nile	4.4 (70.0)	5.3 (87.9)	8.3 (62.5)	6.7 (81.7)	15.2 (59.3)	20.9 (59.6)
Red Sea	3.4 (95.3)	4.2 (82.0)	4.9 (79.1)	5.7 (74.5)	11.1 (74.2)	12.9 (60.0)
Kassala	3.3 (99.6)	3.7 (97.3)	4.2 (96.2)	4.9 (94.6)	7.5 (100)	10.9 (100)
Gedarif	4.1 (82.6)	5.0 (89.6)	5.7 (91.2)	8.1 (64.1)	10.5 (81.2)	13.9 (73.2)
Gezira	9.9 (95.3)	12.1 (91.7)	15.0 (93.3)	19.6 (92.2)	31.4 (86.4)	40.4 (86.2)
Sinnar	3.4 (94.6)	3.9 (95.4)	4.0 (89.8)	4.4 (90.7)	7.6 (89.9)	10.6 (83.3)
White Nile	3.4 (86.1)	5.0 (80.7)	5.2 (93.2)	6.7 (79.3)	9.9 (82.3)	16.1 (84.0)
Blue Nile	1.9 (89.2)*	2.2 (89.2)	2.6 (86.4)	3.3 (89.6)	5.1 (88.8)	7.0 (88.7)
Khartoum	23.5 (79.0)	31.5 (72.1)	47.6 (60.1)	61.9 (53.6)	90.8 (51.4)	110.7 (52.2)
N. Kordofan	3.3 (97.0)	3.9 (92.1)	4.8 (100)	5.5 (97.3)	9.3 (92.8)	15.2 (90.6)
S. Kordofan	2.1 (93.5)	3.1 (94.2)	3.2 (91.8)	3.6 (91.2)	5.8 (94.6)	9.3 (90.9)
N. Darfur	2.9 (98.8)	3.2 (95.0)	4.3 (96.9)	5.5 (85.9)	8.9 (90.5)	13.0 (87.7)
S. Darfur	3.9 (94.3)	4.1 (93.5)	5.6 (96.4)	5.6 (95.1)	10.4 (70.8)	12.6 (80.9)
W. Darfur	1.6 (100)	2.1 (100)	2.4 (95.3)	2.7 (94.8)	7.5 (98.2)	6.4 (92.6)

Total	73.4 (89.5)	95.1 (87.9)	124.3 (80.9)	152.2 (75.2)	264.1 (68.2)	321 (73.1)

* imputed.

Over the period under consideration, and despite the variation in the rate of growth for the various states, total public expenditure at the level of the states recorded an increasing trend: from about 73 billion Dinars in 2000 to about 321 billion Dinars in 2005 (recording an annual rate of increase of about 34.3 percent in nominal terms). This is both expected and understandable, given not only population growth but the deepening decentralization process. The share of current expenditure in total expenditure by the states, however, fluctuated at the level of each state. For all of the states taken together there is evidence of a declining trend, especially considering the end points. The last row of the table clearly reports such an overall declining trend from about 90% of total expenditure in 2000 to about 73% in 2005. For the year 2005 the table shows that the share of current expenditure in the total varied from a low of about 52% in Khartoum state (followed by 60% for Nile state) to a high of 100% for Kassala state (followed by about 93% for West Darfur, excluding West Kordofan for which the figures are imputed rather than officially reported).

As noted in the context of the standard framework, the functional structure of current expenditure can be used to derive weights for an allocation formula. Unfortunately a detailed functional classification of current expenditure is not available. However, to get a preliminary idea we looked at the structure of current expenditure from a quasi-functional perspective. This is done on the basis of UNICONS compilation where we were able to identify six categories of expenditure: administration, agriculture, education, health, social affairs and urban. A seventh category on "localities" is excluded. To smooth the fluctuations over time, we computed the average of averages over the six years period for each of the identified categories. The results of the exercise are given in table (4) below, where we provide the most important descriptive statistics.

Table (4):
The Structure of Current Expenditure at the Level of the States
(average percentage shares 2000-2005)

Expenditure Item	Mean	Standard Deviation	Median	Minimum	Maximum
Administration	45..02	2.84	44.34	24.63 (S. Darfur)	62.59 (S. Kordofan)
Agriculture	5.82	0.52	5.30	2.80 (Khartoum)	9.89 (S. Darfur)
Education	18.36	5.76	18.17	7.93 (S. Kordofan)	29.49 (Gezira)
Health	20.83	7.81	22.19	2.80 (Khartoum)	29.17 (Kassala)
Social Affairs	3.74	1.63	3.45	1.52 (White Nile)	6.88 (River Nile)
Urban	4.85	2.44	4.54	1.84 (N. Kordofan)	10.18 (Khartoum)

It is significant to note that the structure of the current budget is almost identical when judged either by the mean or the median of the averages. Thus, on average, about 45% of the current budget at the state level is spent on administration (ranging from a low of about 23% for South

Darfur to a high of about 63% for South Kordofan). This is followed by expenditure on health that accounts for about 21% of current expenditure (ranging from a low of about 3% for Khartoum to a high of about 29% for Kassala). The third highest category of current expenditure is education accounting for an average of about 18% (ranging from a low of about 8% for South Kordofan to a high of about 30% for Gezira).

3.2. Revenue Capacity:

Fairly detailed information on own revenues at the level of the Northern States can be found in annual reports produced by the Taxation Chamber. On the basis of such official reports UNICONS was able to undertake a compilation exercise, using official Ministry of Finance and National Economy files. The compilation is done over the period 2000-2005. Total revenue at the disposal of sub-national state governments is composed of two major components: own revenue and federal transfers. Federal transfers include, as the case may be, current support, development support, value added tax, compensation for agricultural tax, and additional support. Own revenue is classified in the usual manner of tax revenue (transferred taxes, animal tax and excise duties as the case may be) and non-tax revenue (departmental fees, service charges, local revenues as the case may be). Table (5) reports own revenues in billion Sudanese dinars and the share in total revenues between brackets.

Table (5):
Total Own Revenue and Its Share in Total Revenue at the Level of Northern States (billion dinars and %)

State	2000	2001	2002	2003	2004	2005
Northern	1.4 (61.2)	1.1 (35.0)	1.4 (40.5)	1.5 (34.6)	3.3 (37.6)	12.4 (36.9)
Nile	3.0 (69.2)	2.4 (48.1)	4.2 (50.9)	2.5 (33.2)	8.2 (50.3)	9.0 (45.1)
Red Sea	4.1 (95.5)	5.1 (73.4)	4.3 (70.3)	7.5 (77.4)	7.5 (72.3)	10.4 (72.7)
Kassala	1.9 (62.1)	1.7 (49.1)	1.6 (37.3)	1.9 (38.3	2.3 (32.8)	2.4 (23.2)
Gedarif	3.5 (92.8)	3.3 (70.7)	2.4 (43.2)	3.8 (48.7)	4.3 (41.1)	4.3 (33.1)
Gezira	3.2 (37.1)	3.0 (27.9)	3.5 (22.8)	4.6 (25.7)	8.8 (27.1)	11.9 (28.9)
Sinnar	1.7 (60.6)	2.1 (52.9)	1.4 (36.1)	1.2 (29.7)	2.0 (27.8)	3.3 (32.3)
White Nile	3.3 (96.5)	2.0 (45.7)	2.4 (49.6)	3.5 (51.7)	3.3 (34.4)	6.3 (41.0)
Blue Nile		0.6 (27.0)	0.4 (15.4)	0.7 (20.0)	1.0 (19.1)	1.0 (15.7)
Khartoum	23.6 (100)	31.7 (100)	44.2 (100)	43.9 (69.9)	61.5 (67.1)	78.9 (69.0)
N. Kordofan	2.3 (62.1)	1.8 (46.4)	1.9 (42.5)	2.4 (38.0)	3.1 (37.5)	3.9 (24.8)
S. Kordofan	0.7	0.9	0.7	1.8	1.5	1.6

	(29.7)	(29.5)	(24.2)	(48.1)	(26.3)	(16.7)
N. Darfur	1.7 (67.4)	1.3 (38.0)	1.5 (26.8)	1.4 (23.8)	1.4 (17.2)	1.3 (10.9)
S. Darfur	2.7 (72.7)	2.9 (66.7)	2.8 (53.2)	3.0 (47.6)	3.7 (44.9)	4.6 (39.6)
W. Darfur	0.9 (53.7)	1.0 (46.5)	0.7 (26.4)	0.5 (15.7)	4.7 (61.7)	1.0 (16.6)
Total	54.0	60.9	73.4	80.2	116.6	152.3

The table shows that own revenue recorded an increase over the period under consideration from about 54 billion Dinars in 2000 to about 152 billion Dinars in 2005. However looking at 2005 it is perhaps clear that eight of the states have very low revenue capacity of less than 5 billion Dinars and that Khartoum dominates the revenue scene accounting for about 52% of total own revenue. This is perhaps an important feature to bear in mind in designing a transparent and fair system of federal transfers. Another important feature is that among the states having a revenue capacity in excess of 5 billion Dinars is the Red Sea. Given the already reported results on HDI this is a highly surprising result!

3.3. Federal Transfers:

As noted above total revenue for each state is reported on the basis of tax and non-tax revenue in addition to federal transfers. Over the period 2000-2005 we have details on such transfers by state. These are reported in table (6) where figures between brackets are the share of federal transfers in total state revenue.

Table (6):
Federal Transfers and their Share in Total Revenue at the Level of Northern States (billion dinars and %)

State	2000	2001	2002	2003	2004	2005
Northern	0.9 (38.7)	2.0 (65.0)	2.1 (59.5)	2.9 (65.4)	5.6 (62.5)	4.1 (63.2)
Nile	1.3 (30.8)	2.6 (51.9)	4.1 (49.2)	5.0 (66.8)	8.1 (49.7)	11.0 (54.9)
Red Sea	0.2 (4.5)	0.8 (14.2)	1.8 (29.7)	2.2 (22.6)	2.9 (27.7)	3.9 (27.3)
Kassala	1.2 (38.1)	1.8 (50.9)	2.6 (62.7	3.1 (61.7)	4.7 (67.2)	7.9 (76.8)
Gedarif	0.3 (7.2)	1.4 (29.3)	3.1 (56.8)	4.0 (51.3)	6.2 (58.9)	8.6 (66.9)
Gezira	5.5 (62.9)	7.8 (72.1)	11.9 (77.2)	13.2 (74.3)	23.6 (72.9)	29.2 (71.1)
Sinnar	1.1 (39.4)	1.4 (41.2)	2.5 (63.9)	2.9 (70.3)	5.2 (72.3)	6.9 (67.8)
White Nile	0.2 (3.5)	2.4 (54.3)	2.4 (50.4)	3.3 (48.3)	6.4 (65.6)	9.0 (58.9)
Blue Nile	---------	1.7 (72.9)	2.2 (84.6)	2.7 (80.0)	4.3 (80.9)	5.5 (84.4)

Khartoum	---------	00 (00)	0.1 (2.7)	18.9 (30.1)	30.1 (32.9)	35.4 (31.0)
N. Kordofan	1.4 (37.9)	2.1 (53.6)	2.6 (57.4)	3.9 (62.0)	5.1 (62.5)	11.8 (75.3)
S. Kordofan	1.6 (70.3)	2.1 (70.5)	2.3 (75.8)	2.0 (52.0)	4.2 (73.8)	7.3 (76.5)
N. Darfur	0.8 (32.6)	2.1 (62.0)	4.1 (73.2)	4.2 (76.2)	6.8 (82.8)	10.6 (89.1)
S. Darfur	1.0 (27.4)	1.5 (33.4)	2.4 (46.8)	3.3 (52.4)	4.5 (55.1)	7.0 (60.4)
W. Darfur	0.8 (46.3)	1.2 (53.5)	1.8 (73.6)	2.4 (84.3)	2.9 (38.3)	5.2 (83.4)
Total	10.5 (15.6)	21.7 (24.7)	46.0 (39.1)	74.0 (48.5)	120.6 (50.9)	163.4 (52.3)

Despite the fluctuations in the percentage share of federal transfers in total state revenues for each state over the period under consideration the last row of the table shows that there is a clear increasing trend. The share of federal transfers increased from about 16% of total revenue in 2000 to about 52% in 2005. This share also varied across states. Thus, for example, in 2005 the share of federal transfers ranged from a low of 27% for the Red Sea state (followed by 31% for Khartoum state) to a high of 89% for North Darfur (followed by 84% for the Blue Nile state). Such variability is, of course, understandable given the factors involved in the revenue mobilization and budget making processes. What is puzzling are the states involved at the two ends of the distribution.

To further understand the current structure of federal transfers it may be appropriate to look at the actual fiscal gaps that federal transfers are supposed to fill. Table (7) provides information on the federal transfers and fiscal gaps for the year 2005. No information is provided for West Kordofan. The column on federal transfers also reports the share of each state in total transfers.

Table (7):
Fiscal Gap and Federal Transfers in Northern States 2005 (billion Dinars)

State	Total Expenditure	Own Revenue	Fiscal Gap	Federal Transfers	Federal Transfers/Fiscal Gap (%)
Northern	12.9	12.4	0.5	4.1 (2.51)	820.0
Nile	20.9	9.0	11.9	11.0 (6.73)	92.4
Red Sea	12.9	10.4	2.5	3.9 (2.39)	156.0
Kassala	10.9	2.4	8.5	7.9 (4.84)	92.9
Gedarif	13.9	4.3	9.6	8.6 (5.26)	89.6
Gezira	40.4	11.9	28.5	29.2 (17.87)	102.5
Sinnar	10.6	3.3	7.3	6.9 (4.22)	94.5

White Nile	16.1	6.3	9.8	9.0 (5.51)	91.8
Blue Nile	7.0	1.0	6.0	5.5 (3.37)	91.7
Khartoum	110.7	78.9	31.8	35.4 (21.67)	111.3
N. Kordofan	15.2	3.9	11.3	11.8 (7.22)	104.4
S. Kordofan	9.3	1.6	7.7	7.3 (4.47)	94.8
N. Darfur	13.0	1.3	11.7	10.6 (6.49)	90.6
S. Darfur	12.6	4.6	8.0	7.0 (4.28)	87.5
W. Darfur	6.4	1.0	5.4	5.2 (3.18)	96.3
Total	312.8	152.3	160.5	163.4 (100)	101.8

The table shows that in the 2005 budget all states reported a fiscal gap that ranged from a low of 0.5 billion Dinars for the Northern state to a high of 31.8 billion Dinars for Khartoum state. The actual federal transfers ranged from a low of 3.9 billion Dinars for the Red Sea state to a high of 35.4 billion Dinars for Khartoum. The last column shows that these federal transfers aimed at exactly meeting the fiscal gap of each state except for the Northern, Red Sea, Khartoum, Northern Kordofan and Gezira states where the transfers were more than the indicated fiscal gap. Noteworthy in this respect is the coverage for the Northern state where the federal transfers were 820 percent of the reported fiscal gap. At the other extreme, the lowest coverage of the fiscal gap is recorded for South Darfur state (about 88% of the fiscal gap) and Gedarif and North Darfur (about 90% of the fiscal gap).

IV. Implementing the Framework: Preliminary Results:

It will be recalled that FFAMC is to "ensure **the transparency and fairness** in regard to the allocation of nationally collected funds to the Government of Southern Sudan and the states", and to "(a) **monitor and ensure** that equalization grants from the National Revenue Fund are promptly transferred to respective levels of government, (b) **guarantee appropriate utilization and sharing** of financial resources, (c) ensure that revenues allocated to conflict affected areas are transferred in accordance with agreed formula, (d) **safeguard transparency and fairness** in the allocation of funds to the Government of Southern Sudan and the states according to established ratios or percentages stipulated in this Constitution". All of the highlighted functions require information on expenditure needs and revenue capacity at all levels of government.

Be the above as it may, recalling the 45 exclusive executive and legislative powers of the states enumerated by the INC in schedule (C), and without loss in generality, and from the perspective of looking at the expenditure needs, these exclusive powers can be classified in seven broad expenditure categories: primary and secondary education (power 22 in schedule C: "primary and secondary schools and education administration in regard thereto"); health care (power 15: the establishment, regulation, and provision of health care, including hospitals and other health institutions); social welfare (power 5: "social welfare including state pensions"); administration (powers 3, 6, 12, 37, 41, 42, 44-45); law and order (powers 2, 7, 14, 19, 20, and 34); economic development (powers 8, 16, 17, 21, 23, 24, 25, 31, 32, and 36); and, a remainder category which we can call 'others', to include the rest of the powers.

Detailed information on the above categories of expenditure at the level of the states is not currently available. As reported in section (III) the best available information is a recent compilation of expenditure data at such level undertaken by UNICONS based on the files of the final accounts submitted to the Ministry of Finance and National Economy. These, however, are not found to be helpful. As an alternative, information from the federal level could be used. For 2003, Ahmed et al (2004: 27, table 7) provided such functional classification of government expenditure. Table (5) provides a summary of this information according to the categories identified above, after excluding "transfers to the States" which amounted to about 61.7 billion Dinars, representing 8.4% of total expenditure (which amounted to 735.9 billion Dinars).

Table (8):

Actual Federal Government Expenditure by Function for 2003

Expenditure Category	Amount (billion Dinars)	Percentage of total (%)	Amended amount (billion Dinars)	Share in Total Expenditure (%)
Education	32.2	4.8	32.2	12.0
Health	10.5	1.6	10.5	3.9
Social Welfare	26.0	1.3	26.0	9.7
Administration	33.6	5.0	33.6	12.5
Law and order	158.0	23.4	49.3	18.4
Economic development	164.6	24.4	57.5	21.4
Other	249.3	37.0	59.1	22.0
Total	674.2	100.0	268.2	100.0

Source: compiled from Ahmed et al (2004: table 7).

Though useful the original percentages of federal expenditure categories are dominated by "defense and security", which appears under our category "law and order", (with a share of 23.4% of total expenditure); "agricultural and industrial production", plus "infrastructure", but excluding "social subsidies", which appear as a consolidated category of "economic development" (with a consolidated share of 24.4% of total expenditure); and the category "other", which in the original classification is called "miscellaneous", which accounts for 37% of total expenditure. This category includes "reserves for wages and salaries", "external and internal debts", "centralized obligations", and "pensions and social security" (which is moved to social welfare in our classification). The amount for the categories "education", "health", and "administration" appear in the above table as in the original.

Obviously all of the above noted dominant categories need to be adjusted so that normal per capita expenditure can be derived. This is done in the above table where we kept the original amounts for education, health, social welfare, and administration as in the original actual expenditure. The original "defence and security category" is adjusted to reflect the relevant "law and order" category by first netting out the cost of the civil war. According to estimates by various quarters the daily cost of the civil war was about US$1 million, which works out as 91.3 billion Sudanese Dinars per year. The remainder of the original category is about 66.7 billion Dinars. Under the original category about 74% of the expenditure was on wages and salaries,

while the remainder was on goods and services. Given the dominance of the military hardware in the goods and services item, we use the wages and salaries share on the remainder of the original category to estimate the quasi-normal expenditure on law and order. This works out as about 49.3 billion Sudanese Dinars. This is the figure that appears in the adjusted column. The total of the adjusted column is about 39.8% of total current expenditure at the federal level. This share of normal expenditure in total federal expenditure can be used to estimate a country wide average per capita expenditure to be applied as per equation (6).

According to the IMF (2006: 22, table 4) total current expenditure for 2005 amounted to 1383 billion Dinars. Applying the above share of normal expenditure in total federal expenditure to 2005 gives rise to per capita expenditure of **15549** Sudanese Dinars. Needless to note that the estimated per capita expenditure needs to be repeatedly adjusted by a relevant factor so as to equate the estimated sum of entitlements to the observed sum of actual expenditure at the level of the states.

Regarding revenue capacity we note that with the advent of oil in 1999 the structure of revenue in the country has changed dramatically. According to the IMF (2006: 22 table 4) in 2005 oil revenue accounted for about 67% of total government revenue (which amounted to 1473 billion Dinars). The remainder of the revenue comprised of tax revenue and departmental fees amounted to about 487 billion Dinars. This implies that national revenue per capita is about **13757** Dinars. This is the reference revenue that will be used in the calculations as appropriate (as per equation 7). As we did with expenditure this reference revenue will be repeatedly adjusted by a relevant factor so as to equate the estimated sum of revenues with the observed sum of actual revenue.

Having noted the above, a first result to report is that the current system of fiscal transfers is not based on population weights. This result is clearly reflected in table (7) above. It is, however, a surprising result. The table below reports the result for 2005.

Table (9):

Federal Transfers to Northern States 2005

State	Fiscal Gap (billion Dinars)	Federal Transfers (billion Dinars)	Per Capita Federal Transfers (Dinars)	Federal Transfers (%)	Population (thousand)	Population (%)
Northern	0.5	4.1	6442	2.51	636.48	2.23
Nile	11.9	11.0	11095	6.73	991.44	3.47
Red Sea	2.5	3.9	5209	2.39	748.68	2.62
Kassala	8.5	7.9	4766	4.84	1657.50	5.82
Gedarif	9.6	8.6	5037	5.26	1707.48	6.00
Gezira	28.5	29.2	7540	17.87	3872.94	13.59
Sinnar	7.3	6.9	5200	4.22	1327.02	4.66
White Nile	9.8	9.0	5393	5.51	1668.72	5.86
Blue Nile	6.0	5.5	7531	3.37	730.32	2.56
Khartoum	31.8	35.4	6250	21.67	5664.06	19.87
N. Kordofan	11.3	11.8	7331	7.22	1609.56	5.65
S. Kordofan	7.7	7.3	6096	4.47	1197.48	4.20
N. Darfur	11.7	10.6	6279	6.49	1688.10	5.92
S. Darfur	8.0	7.0	2164	4.28	3234.42	11.35
W. Darfur	5.4	5.2	2940	3.18	1768.68	6.21
Total	160.5	163.4	5991	100	28502.76	100

The table shows that seven states enjoyed shares in federal transfers that exceeded their corresponding population shares (Northern, Nile, Gezira, Blue Nile Khartoum, North Kordofan, South Kordofan, and North Darfur), while the remaining seven states suffered from having shares less than their population shares. Perhaps the most striking example of the first group is the Nile state which received a federal transfer share of almost double its population share, followed by Gezira. The remaining five states had marginal gaps. At the other extreme is South Darfur which received a share of federal transfers which is about 38% of its population share followed by West Darfur with a transfer share of about 49% of its population share.

Now, suppose, as per the requirement of the CPA, we take own revenue as given and impose the constraint that observed total expenditure at the level of the states be equally distributed such that people enjoy the same level of social services. On the basis of observed per capita expenditure for 2005 we may use equation (10) to calculate the equally distributed equivalent level of per capita expenditure. With an inequality aversion parameter of 2 we calculate this level of expenditure to be **8022** Sudanese Dinars. Multiplying this by the population of each state we get the equally distributed equivalent current expenditure for each state. As it happened the total expenditure resulting from this procedure amounted to 238.6 billion Dinars. To arrive at the observed total expenditure of 312.8 billion Dinars we adjusted the results by a factor of 1.31. The result is reported in table (10).

Table (10):
Equally Distributed Equivalent Expenditure and Required Federal Transfers in Northern States 2005 (billion Dinars)

State	Population (thousand)	Equally Distributed Equivalent Expenditure (billion Dinars)	Adjusted Equally Distributed Equivalent Expenditure (billion Dinars)	Own Revenue (billion Dinars)	Required Federal Transfers (billion Dinars)	Actual Federal Transfers (billion Dinars)
Northern	**636.48**	**5.1**	**7.0**	**12.4**	**-5.4**	**4.1**
Nile	991.44	8.0	10.9	9.0	1.9	11.0
Red Sea	**748.68**	**6.0**	**8.2**	**10.4**	**-2.2**	**3.9**
Kassala	1657.50	13.3	18.2	2.4	15.8	7.9
Gedarif	1707.48	13.7	18.7	4.3	14.4	8.6
Gezira	3872.94	31.1	42.5	11.9	30.6	29.2
Sinnar	1327.02	10.7	14.6	3.3	11.3	6.9
White Nile	1668.72	13.4	18.3	6.3	12.0	9.0
Blue Nile	730.32	5.9	8.1	1.0	7.1	5.5
Khartoum	**5664.06**	**45.4**	**62.1**	**78.9**	**-16.8**	**35.4**
N. Kordofan	1609.56	12.9	17.6	3.9	13.7	11.8
S. Kordofan	1197.48	9.6	13.1	1.6	11.5	7.3
N. Darfur	1688.10	13.5	18.5	1.3	17.2	10.6
S. Darfur	3234.42	26.0	35.5	4.6	30.9	7.0
W. Darfur	1768.68	14.2	19.4	1.0	18.4	5.2
Total	28502.88	238.6	312.8	152.3	160.5	163.4

Comparing the last two columns it is clear that the current system is not based on an equally distributed concept of federal transfers. If such a concept is adopted three of the states will not be receiving transfers in view of their relatively high revenue capacity. These states are Northern (with a fiscal surplus of 5.4 billion Dinars), Red Sea (with a surplus of 2.2 billion Dinars), and Khartoum (with a surplus of 16.8 billion Dinars). Although under the current system all states received federal transfers Khartoum state received a staggering 35.4 billion Dinars (almost 22% of the total). Under the equally distributed equivalent expenditure assumption a number of marginalized states would be receiving much higher amounts of transfers compared to the existing system. Notable among these are South Darfur (with a huge entitlement of about 31 billion Dinars), West Darfur (18 billion), North Darfur (17 billion), Kassala (about 16 billion), Gedarif and Nort Kordofan (14 billion each), White Nile (12 billion), South Kordofan (11.5 billion), and Sinnar (11 billion). Indeed under this assumption all states, except the Nile state, will be receiving Federal transfers which are much higher than what the current system gives them.

We are now in a position to look at a federal transfer system that respects the development stage of each state as reflected in the human development index. If transfers are to reflect the inequality concerns of the INC and the CPA then expenditure needs for each state will need to be adjusted according to a factor related to an equally distributed equivalent development achievement as per equation (12). Such adjustment will necessarily imply increased expenditure. Similarly, adjusted

standardized revenue, as per equation ( ), will imply increased revenue capacity. The result of this exercise is reported in table (11).

Table (11):
Equally Distributed Adjusted Standardized Expenditure and Revenue in Northern States 2005

State	Population (thousand)	Standardized Expenditure (billion Dinars)	HDI Ratio	Adjusted Standardized Expenditure (billion Dinars)	Standardized Revenue (billion Dinars)	Inverse HDI Ratio	Adjusted Standardized Revenue (billion Dinars)
Northern	636.48	9.90	0.66	6.53	8.77	1.51	10.08
Nile	991.44	15.42	0.56	8.64	13.67	1.77	18.42
Red Sea	748.68	11.65	3.53	41.09	10.32	0.28	2.20
Kassala	1657.50	25.77	1.63	42.01	22.85	0.62	10.78
Gedarif	1707.48	26.55	1.13	29.99	23.52	0.88	15.75
Gezira	3872.94	60.22	0.49	29.51	53.37	2.03	82.45
Sinnar	1327.02	20.63	0.76	15.68	18.29	1.32	18.37
White Nile	1668.72	25.96	0.71	18.42	23.01	1.41	24.69
Blue Nile	730.32	11.33	4.86	55.11	10.60	0.21	1.70
Khartoum	5664.06	88.07	0.62	54.60	78.05	1.62	96.22
N. Kordofan	1609.56	25.04	0.82	20.53	22.18	1.22	20.59
S. Kordofan	1197.48	18.62	1.46	27.19	16.51	0.68	8.55
N. Darfur	1688.10	26.25	0.64	16.80	23.27	1.57	27.80
S. Darfur	3234.42	50.30	0.90	45.27	44.57	1.12	37.99
W. Darfur	1768.68	27.50	1.07	29.43	24.37	0.93	17.24
Total	28502.88	443.20	---	440.82	392.80	--------	392.83

As is clear from the above table adjusted standardized expenditure is about 443 billion Dinars while adjusted standardized revenue is about 393 billion Dinars indicating that overall there will be a need for federal transfers. A fair distribution of these transfers can be calculated based on the above information as per table (12) below.

Table (11):
Adjusted Standardized Expenditure and Revenue in Northern States 2005

State	Population (thousand)	Adjusted Standardized Expenditure (billion Dinars)	Adjusted Standardized Revenue (billion Dinars)	Required Fiscal Transfers (billion Dinars)	Actual Federal Transfers (billion Dinars)
Northern	636.48	6.53	10.08	**-3.55**	**4.1**
Nile	991.44	8.64	18.42	**-9.78**	**11.0**
Red Sea	748.68	41.09	2.20	38.89	3.9
Kassala	1657.50	42.01	10.78	31.23	7.9
Gedarif	1707.48	29.99	15.75	14.24	8.6
Gezira	3872.94	29.51	82.45	**-52.94**	**29.2**
Sinnar	1327.02	15.68	18.37	**-2.69**	**6.9**
White Nile	1668.72	18.42	24.69	**-6.27**	**9.0**
Blue Nile	730.32	55.11	1.70	53.41	5.5
Khartoum	5664.06	54.60	96.22	**-41.62**	**35.4**
N. Kordofan	1609.56	20.53	20.59	**-0.06**	**11.8**

S. Kordofan	1197.48	27.19	8.55	18.98	7.3
N. Darfur	1688.10	16.80	27.80	**-11.00**	**10.6**
S. Darfur	3234.42	45.27	37.99	7.28	7.0
W. Darfur	1768.68	29.43	17.24	12.19	5.2
Total	28502.88	440.82	392.83	48.31	163.4

The table shows that a federal transfer system that is based on standardized per capita expenditures and revenues across states and taking into account the development achievements of the various states compared to an equally distributed achievement would result in a completely different pattern of federal transfers from the existing system. As the table clearly shows, such a system will identify eight surplus states (Northern, Nile, Gezira, Sinnar, W. Nile, Khartoum, N. Kordofan, and N. Darfur). Only six states deserve to receive federal transfers in order to meet their standardized expenditure needs (Red Sea, Kassala, Gedarif, Blue Nile, South Kordofan, South Darfur, and West Darfur). The identified states accord with our intuitive understanding of the "marginalized" areas of the country. This implies that the proposed framework is potentially endowed with **the required transparency feature as per the INC and the CPA**.

For the states identified as deserving federal transfer, the calculated amounts of required federal transfers are much higher than the observed amounts. They range from a high of about 53 billion for Blue Nile to a low of 7.3 billion for South Darfur. Overall, given the increased expenditure estimates, total required transfers amount to 176 billion Dinars. This is slightly higher than the observed transfers of 163 billion Dinars. The implied allocation of these transfers among deserving states also accords with our intuitive understanding of their development achievements. This implies that the proposed framework is potentially endowed with **the required fairness feature as per the INC and CPA**. If cross transfers between surplus and deficit states are allowed, it can easily be ascertained that the net required federal transfers will amount to about 48 billion Dinars.

V. Instead of a Conclusion: Guidelines for Future Steps:

As noted above, the FFAMC is charged with a number of important functions in the context of igniting a broadly defined development process in the country anchored on "poverty reduction" in a democratic society. FFAMC is to “ensure the transparency and fairness in regard to the allocation of nationally collected funds to the Government of Southern Sudan and the states”, and to “(a) monitor and ensure that equalization grants from the National Revenue Fund are promptly transferred to respective levels of government, (b) guarantee appropriate utilization and sharing of financial resources, (c) ensure that revenues allocated to conflict affected areas are transferred in accordance with agreed formula, (d) safeguard transparency and fairness in the allocation of funds to the Government of Southern Sudan and the states according to established ratios or percentages stipulated in this Constitution”.

Given the guiding principles spelt out clearly in the INC and noted in the introduction, we argued that a transparent and fair system of federal transfers can be based on the concept of the equally distributed equivalent development achievements. We have shown that such a system will give rise to expenditure entitlements and revenue responsibilities which are markedly different from the current observed system. We were able to demonstrate this major result for 2005, despite the paucity of data. The following guidelines are meant to assist FFAMC in refining its approach to establish the required transparent and fair system of federal transfers:

(i) Data compilation: it needs to be reiterated that any **transparent system** for federal transfers will depend crucially on the availability of detailed

information on the fiscal variables to be used not only at the level of sub-national jurisdictions but also at the level of the federal government. Thus, FFAMC needs to compile relevant data on a number of important variables, fiscal as well as structural, from the level of the states in collaboration with all government units. It is highly recommended that such data be compiled from official sources already engaged in data collection, and that FFAMC should not get involved in such data collection efforts;

(ii) given data availability FFAMC should build an in-house capacity for construction of important indicators relevant to its work (such as GDP at the level of the states, resource endowments, infrastructural assets, and HDI), and for building different scenarios and alternative frameworks for federal transfers;

(iii) given the in-house capacity under (ii) FFAMC should establish a regular forum to interact with stake holders in society by presenting its in-house generated results to a wider audience with the aim of ascertaining the values of society regarding aversion to inequality in the distribution of expenditure entitlements;

(iv) given the forum in (iii) above FFAMC should be able to interact with policy makers at the level of the states with a view of streamlining budget proposals that will require minimum adjustments at higher levels of the approval process.

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ANNEX 1

The Standard Framework:

As is well known intergovernmental fiscal transfers are required to ensure that revenues roughly match the expenditure needs of various levels of sub-national governments[3]. In the context of the INC they are required to advance the cause of such principles as fairness, equity and shared development. These fiscal transfers are usually discussed in terms the concepts of vertical and horizontal fiscal gaps. These concepts are derived from the famous social welfare concepts of vertical and horizontal equity. In welfare analysis, vertical equity requires the treatment of those (individuals, states, local governments etc) who are unequal in all relevant circumstances unequally; on the other hand, the principle of horizontal equity requires the treatment of those, who are in all relevant senses, identical identically[4].

As is probably well known the vertical equity objective in the context of taxation has been related to the concept of the ability to pay. The most famous approach in this respect is the utilitarian one where the social welfare function is the sum of the utilities of individuals (here states) defined on fixed pre-tax incomes. Maximizing social welfare requires that after tax incomes be equalized[5].

According to Shah (2006) a "vertical fiscal gap is defined as the revenue deficiency arising from a mismatch between revenue means and expenditure needs", typically at lower levels of government (e.g. states, local councils etc). Such a vertical fiscal gap may arise due to inappropriate assignment of spending responsibilities; centralization of taxing powers; tax competition by sub-national levels of government; and, heavy tax burdens imposed by a central government.

The standard framework for transfers is based on revenue capacities and expenditure needs (see, for example, Ahmed, Singh and Fortuna (2004), and Ahmed and Searle (2005)). For a country with m regions the formula is derived from an identity defining entitlement to transfers, T_i, as the difference between standard public expenditure needs, E_i, and the sum of standard revenue capacity, R_i, and other transfers (e.g. specific purpose transfers), Z_i (Ahmed, Singh and Fortuna (2004). The identity in question could be written as:

(1) $T_i \equiv E_i - R_i - Z_i$

The identity requires the central government transfer "to cover the difference between each region's standard expenditure needs and revenue capacity, to ensure that a region with standard tax effort will be able to provide a standard level of public services". Note that the sum of entitlements in the identity over all states may or may not be equal to the available pool of resources that can be shared among states, B. This observation requires adjusting actual transfers, AT_i proportionately according to the size of the available pool of resources as follows:

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[3] For a crisp summary of the early literature on the economics of fiscal federalism see Elshibly (1990: 4-16).

[4] See, for example, Atkinson and Stiglitz (1980: 350- 356).

[5] In his famous textbook Musgrave (1959: 160) notes that in the context of taxation the "requirements of horizontal and vertical equity are but different sides of the same coin. If there is no specified reason for discriminating among unequals, how can there be a reason for avoiding discrimination among equals". But, see, Atkinson and Stiglitz (1980).

(2) $AT_i = [B/ \Sigma_i T_i]\ T_i$

To make the above formula operational there is a need to calculate (or estimate) standard revenue capacity and standard expenditure needs.

Depending on the availability of detailed information for sub-national governments a possible way of measuring revenue capacity is to calculate the revenue that could be raised in the region (or state) if the sub-national government taxes all the standard tax bases, X_{ij}, with a standard tax rate on the jth tax base, τ_j (= national average effective tax rate). Thus, we have the standard revenue capacity of any state defined by:

(3) $R_i = \Sigma_j\ \tau_j\ X_{ij}$

Note that the use of the national average effective tax rate is recommended in place of the region's own effective tax rate in order to ensure that "regions with a high tax effort are not penalized and regions with a low tax effort are not rewarded".

As is probably clear, the method requires the availability of detailed and accurate information on major tax bases at the level of regions. Such information is not expected to be available in developing countries. As a result a number of alternative calculation methods, albeit all indirect, are available in the literature. These methods, in turn, require the estimation of a relationship between revenue capacity and economic activity indicators such the GDP of the region (usually problematic in developing countries and may not be available), personal income or possibly total consumption expenditure (both being problematic with consumption expenditure proving to be a more accurate reflection of welfare), and total sales in the region.

In this standard framework expenditure needs are estimated (or calculated) on the basis of standardized expenditure weights and multipliers for various expenditure categories (e.g. education, health, social welfare, government administration, law and order, economic development etc). It turns out that the expenditure weights are based on the age structure of the population. The standard expenditure multipliers are derived from the actual expenditure under each category as a share of total expenditure.

In the absence of detailed information on population age structure the standard framework could simply be based on population. Thus, for example, if $\beta_i = N_i/N$ is used to denote the share of the population of the ith state in total population, α_k is the share of the kth category in total expenditure, then the standard expenditure need of the ith state in the kth category is given by E_{ik} as follows:

(4) $E_{ik} = \alpha_k\ \beta_i\ E$

The total standard expenditure needs of the ith state is the summation over the k categories of expenditure as follows:

(5) $E_i = \Sigma_k\ E_{ik} = \Sigma_k\ \alpha_k\ \beta_i\ E = \beta_i\ E\ \Sigma_k\ \alpha_k = \beta_i\ E$

This pure population based calculation is the result of the fact that the shares of the various expenditure categories sum to unity.

Even under this standard framework special needs, constitutionally mandated or otherwise, can be handled through social welfare weights attached to standard and special needs.

A less demanding proposal to estimate equalization grants is given by Ahmed and Searle (2005: 15-16). Estimating expenditure needs and revenue capacity is based on the average at the level of the country as a whole (i.e. overall per capita expenditure and overall per capita revenue) with appropriate adjustments. Thus, we have expenditure needs given by:

(6) $E_i = N_i\,[E/N].v_i$,

where (E/N) is the average expenditure standard in the country and v_i is a term representing a number of independent factors relevant to the ith state. Specifically it is proposed that v_i should take into account such factors as the differential coverage of the population eligible for services relative to the total population, differential costs arising out of scale factors leading to lower costs, differential costs arising out of concentration or dispersion of eligible population, and differences in cost arising out of social, physical and economic. Revenue capacity is defined in a similar fashion to be as follows:

(7) $R_i = N_i\,[R/N].r_i$

where [R/Y] is the per capita revenue at the level of the country and r_i is the differential revenue raising capacity of the ith region defined in terms of per capita income (or wealth) of the region relative to that of the country.

ANNEX 2

Methodology:

The above standard framework, it can easily be argued, could be applied for countries enjoying normal circumstances. Countries emerging from conflicts, where grievances are expressed in terms of a marginalization discourse, need to be treated in a different fashion albeit respecting the identities between required expenditures and own revenue capacities of the constituent sub-national levels of government. The INC guiding principles for the equitable sharing of resources and common wealth, quoted in the introduction, accord equity a high priority in intergovernmental transfer of resources. Further, according to the CPA "**Southern Sudan and those areas in need of construction/reconstruction, shall be brought up to the same average social/economic standard and public services as the Northern States**". An MDG consistent indicator of the average social/economic standard of public services is the Human Development Index (HDI)[6].

To account for these constitutional guiding principles it is suggested that perhaps the best approach is to base the shares of the various States out of the total transfer funds on the concept of "equally distributed equivalent development achievements"[7]. The underlying concept was first developed in the context of finding an inequality measure based on an explicit welfare function. As such, therefore, the "development achievement" in question is the per capita income[8]. In its original formulation the "equally distributed equivalent income" of a given distribution of total income is defined as "that level of per capita income which if enjoyed by everybody would make total welfare exactly equal to the total welfare generated by the actual income distribution". In technical terms if $W(y_i)$ is used to denote the welfare level enjoyed by the ith individual, y_e , the equally distributed equivalent level of income is given by:

(8) $n\, W(y_e) = \Sigma W(y_i)$,

where n is the number of individuals and the summation is over them. A measure of equality in the distribution involved is given by the ratio of the equally distributed level of income to mean income.

The most widely used form of the individual welfare function is that of constant elasticity. Such a form enables the calculation of the equally distributed equivalent

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[6] It will be recalled that the HDI accounts for social and economic achievements in health (measured by life expectancy at birth or any aggregate measure of health); education (measured by a combined school enrolment ratio for the three pre-tertiary level) and per capita income (in its logarithm). The HDI is a simple average of the constituent indicators where for each of the three areas an indicator is calculated as follows: $I_k = [x_k - x_{min}]/ [x_{max} - x_{min}]$, where x_k is health, education and income in state k as the case may be; x_{max} (x_{min}) the measure for the best (worst) performing state.

[7] For an alternative proposal see Elbadawi and Suliman (2006).

[8] See Atkinson (1970) and Sen (1997).

attribute in a transparent fashion. Thus, interpreting y as a development achievement we have,

(9) $W(y) = [y^{(1-\varepsilon)}]/(1-\varepsilon)$; for $\varepsilon > 0$ and $\varepsilon \neq 1$;
$= \log y$; for $\varepsilon = 1$.

The marginal utility of this function is given by $W'(y) = y^{-\varepsilon}$, and thus ε is the elasticity of the marginal utility which measures aversion to inequality in society. Higher values of ε reflect increasing aversion to inequality.

Using the definition of the equally distributed equivalent attribute, and the social welfare function, we have:

(10) $y_e = [1/n\ \Sigma y_i^{(1-\varepsilon)}]^{1/(1-\varepsilon)}$

In what follows, and in view of the fact that we are dealing with states (or regions), equation (10) needs to be adjusted such that it is the population weights that are used. Further, in applying the concept we need to note that the development achievement index is the Human Development Index (HDI). Thus, we have, where β is the population weight of the state or region:

(11) $HDI_e = [\Sigma\ \beta_i\ HDI_i^{(1-\varepsilon)}]^{1/(1-\varepsilon)}$

The equally distributed equivalent development achievement can be used to define the adjustment terms in the standard expenditure needs of equation (6) given by v_i , and the standard revenue capacity of equation (7), given by r_i.

For the expenditure adjustment factor an inverse rule is proposed such that we have:

(12) $v_i = HDI_e / HDI_i$

Thus the adjustment factor gives more weight to poorer states with an HDI below the equally distributed equivalent development achievement. Such weighting is similar to the inverse, and the distance, rules of per capita income used by the Indian Planning Commissions[9]. The difference is that (12) takes into account not only per capita income but also achievements in health and education as required by the INC.

The inverse of (12) suggests itself for the adjustment factor for revenue capacity. Interpreting broad development achievements as reflecting not only the narrow tax base of the state as reflected in GDP per capita, but other endowments as well, we have:

[9] The inverse rule is given by $[N_i/y_i]/\{\sum N_i/y_i\}$, where y is a measure of per capita domestic product. The distance rule is given by $[(y_h - y_i)N_i]/\{\Sigma(y_h - y_i)N_i\}$, where y_h is per capita income in he richest state. Note, however, in assigning the richest state a non-zero weight its distance is calculated on the basis of that for the next richest state. This, of course, is both arbitrary and problematic.

(13) $r_i = HDI_i / HDI_e$

Note that this adjustment requires that states with an HDI higher than the equally distributed equivalent human development achievement are expected to have a higher tax effort per capita. While this seems like a reasonable adjustment factor it not clear why one would adjust observed revenues in such a manner.

ANNEX 3

Calculation of GDP at State Level:

As a result of lack of data on GDP at the State level, it is inevitable that we must resort to indirect methods of estimation. In what follows such a method is used to estimate GDP produced by the various states; and no claim to absolute accuracy is made.

For this purpose we estimated an equation relating the (logarithm of) infant mortality rate (IMR) to that of real per capita GDP (i.e. GDP per capita in US$ PPP as reported by UNDP (2006: 283-286)). The estimated equation is, where figures between brackets are heteroskedastic consistent t-values, based on a sample of 163 countries for which relevant data was available for 2004:

$$\text{(14) Log IMR} = \underset{(16.9)}{4.073} - \underset{(32.2)}{0.908} \log y; \quad R^2 = 0.823$$

The justification for using the above equation is that a recent Government of Sudan (2007) reports IMR for all states in Sudan. Using the reported IMR for the country the above estimated equation can be used to obtain the ratio of real per capita GDP in any state to that of the country as a whole as follows:

$$\text{(15) Log IMR}_c - \text{Log IMR}_j = -0.908\,[\log y_c - \log y_j] = -0.908\{\log[y_c/y_j]\}$$

where y_c is the per capita GDP of the country. Note that the left hand side, divided by -0.908, completely determines the logarithm of the ratio on the right hand side. By taking the antilogarithm of the log ratio we get the ratio of the per capita GDPs in question.

Optimum Vertical Transfers for FY 2008

1. **The formula**. An objective formula for estimating the size of transfers to any given state in the federal system can be arrived at through the following process:

- Estimate the average cost of delivering the package of social services and other public goods per person that the state is required to deliver according to the INC, the CPA and the DPA
- Multiply this with the total size of the population of the state to arrive at the total cost of the service delivery for the state (C_i)
- Estimate the own state revenue as a multiple of a tax rate (t) and the income of the state Y_i (where the income at the state level could be estimated by a suitable methodology): $R_i=t.Y_i$
- The required transfers for the state i (T_i) is thus given by cost (C_i) minus own revenues: $R_i = C_i - R_i$
- The total vertical transfers to the 15 Northern States (for example) is given by: $T_N=T_1+T_2+...+T_{15}$ (and the same applies for the ten southern states)

Comment: it should be noted that the above formula espouses both goals of equity and efficiency: cost of service delivery is equalized for every person in the Sudan no matter where she/he lives in the country; the tax rate is the same across the country; potential own resource mobilization is based on the income level of the state (see the paper by Elbadawi and Suliman for more detailed discussions).

If the allocation to the state understates the costs or exaggerates the own resources, states will be forced to do either or both of two things: under-provide the social services, thus setting back an already difficult MDG situation in Sudan (see the paper by Professor Ali) and/or impose exorbitant taxes on an already heavily-taxed population, thus directly reducing social welfare and productive activities, especially non-oil exports--already at an all time low in an era of oil windfall and explosive government expenditure.

The moral of the proposed formula is that vertical transfers to the state should be equitable, adequate and based on objective criteria and that the budget process should fully reflect these considerations.

2. **Assumptions.** Subscribing to the above, we apply the proposed formula using the average national tax rate and the share of spending on education and health in total expenditure at the sub-national level for some lead reforming African countries.

- Tax rates: the average tax rate for these countries comes to about 15 percent

For comparison, we note that the average national tax rate in Sudan over 1970-2002, as determined from the main tax handles, was about 33 percent. Such high rate, however, tends to encourage tax evasion and avoidance. In our view, given the already high prevailing national tax rate, states should not levy additional rates on the same tax base; instead, the current national tax base should be divided up between the two levels of governments. It should also be noted that high tax rate by itself may not generate high

revenues. Tax compliance, the level of granted tax exemptions and the degree of enforcement of tax law, that is, the fiscal effort are equally important in determining actual revenue collection.

- Expenditure needs per capita: given the recently expanded fiscal mandate of the states, which now includes, in addition to basic education and health, security, higher education and the judicial system, we assume that, on average, 39 per cent of recurrent spending will be needed for the states to meet their fiscal responsibilities: about SDD 6979.6 per person (in fixed 2005 prices). It should be noted that the corresponding actual figure for the FY 2005 was 4580.

- Population and urbanization rates: maintain their growth level, as projected by the CBS, through year 2008.

The own resource mobilization is estimated at 15 percent of the income of the state (Y_i), which is in turn based on the degree of urbanization of the state. According to this criterion the estimated state income in 2008 ranges from Ls. 24200.48 million for Khartoum (the most urbanized) to Ls. 90.72988 million for West Darfur, the least urbanized see table 1.

3. **Simulations.** Using the above assumptions in the above formula, the estimate of the aggregate vertical transfers to the 15 northern states for FY 2008-- consistent with the envisioned, and significantly expanded, state fiscal mandate-- would come to **Ls. 8.3 billion**, in fixed 2005, about **9.78 billion** if expressed in current 2008 prices, assuming 9% annula inflation rate (see table 1).

Though the objective of this input is to contribute an input to the FY 2008 budget process regarding the total vertical net transfers to the 15 northern states, reflecting the views of the FFAMC, the proposed methodology could also provide guidance to other levels of resource allocation within the federal fiscal system:

- Despite the lack of data, the FFAMC should encourage the GOSS to adopt the above criteria for its own allocation to the 10 southern states, using informed guess about the size of state population and rates of urbanization (possibly from NGO estimates ..etc)
- Since the proposed formula is a bottom-up formula, it allows estimation of horizontal allocation between states, which the FFAMC can also take as a guide for assessing its own formula that it currently applies for horizontal allocation. For example, the proposed formula calls for net per capita allocation ranging from: Ls 28.268 for highly urbanized Khartoum to, respectively, Ls 105.1 and Ls 119.519 for sparsely populated Northern and West Darfur states (see Elbadawi and Suliman for full information on this).

4. Concluding Comments:

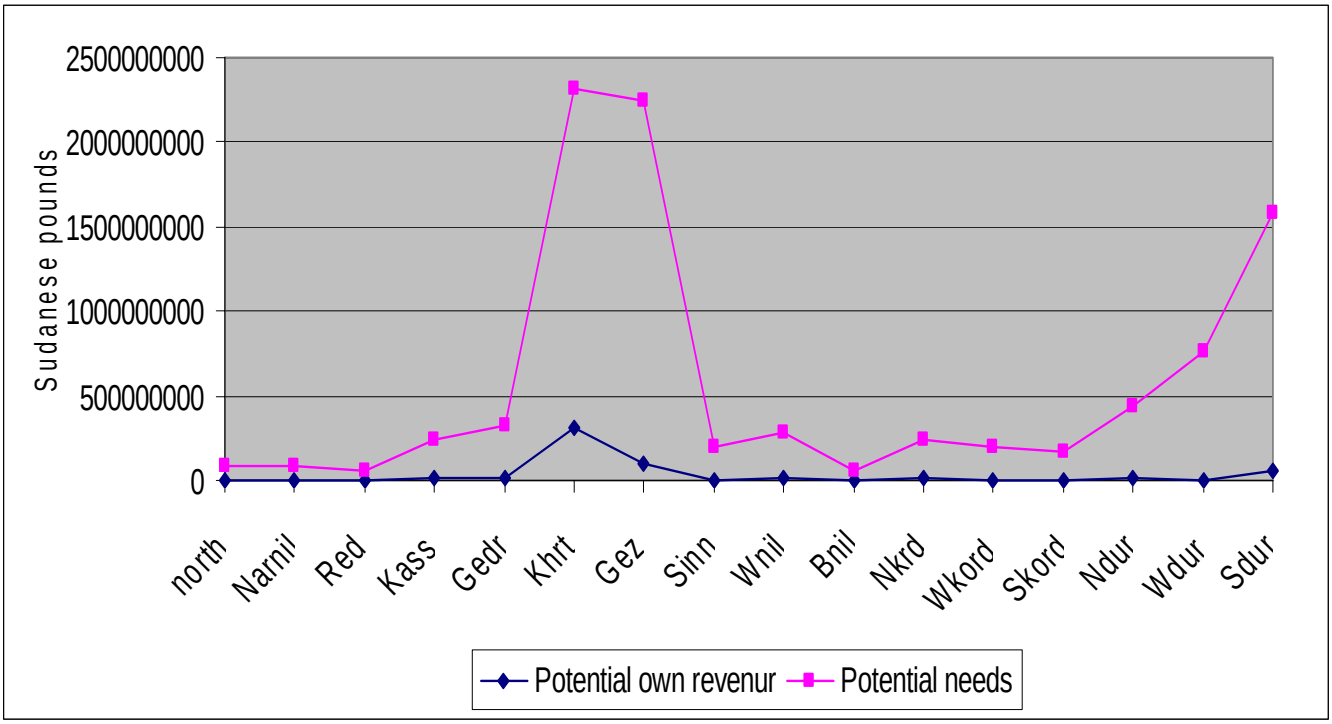
The total revenue for 2007 is about $9 billion. Transfers to northern states including all (vat, agr taxes, development, and current) amounted to $ 3 billion (about 33% of revenues).

If we assume growth rate of revenues in 2008 of 12% then total revenues will be $ billion 10.1 (SDG 20.2 b). Assuming zero inflation (during 2005-08) and applying the formula would lead the very conservative estimate of optimum transfers to the northern states in 2008 of SDG 8.3 billion (or about $ 4 billion). Therefore, the percentage of transfers to total revenues for the northern states in 2008 will be around 40% compared to 2007 transfers of 33%. This would suggest an increment of only 7%, which should be very measured rise on view of the significantly expanded fiscal mandate of the states in the 2006-08 budgets.

Table (1): Potential Revenue and Potential Needs FY2008

State	Population (In 1000s)	Urban Population (In 1000s	Potential Own Revenue (in million Ls.)	Potential Needs (in million Ls)	Required Federal Allocation with zero inflation (in million Ls.)	Required Federal Allocation Adjusted for Inflation (in million Ls.)
Northern	624	103	1.0	80.6	81.6	96.9
Nahr Alnil	1012	349	1.0	84.3	85.3	101.3
Red Sea	735	466	0.7	55.9	56.6	67.3
Kassala	1671	598	2.8	220.8	223.6	265.6
Algedarif	1736	507	3.7	297.4	301.1	357.7
Khartoum	5720	4939	23.9	1681.5	1705.4	2026.2
Algezira	3903	914	25.6	2035.6	2061.2	2448.9
Sinnar	1337	387	2.2	179.9	182.1	216.4
W. Nile	1692	552	3.2	251.7	254.9	302.8
B. Nile	729	201	0.7	58.6	59.3	70.4
N. Kordofan	2828	840	5.1	412.3	417.4	495.9
S. Kordofan	1217	318	2.0	161.9	163.9	194.8
N. Darfur	1718	367	5.2	421.3	426.5	506.7
W. Darfur	1783	243	9.0	743.9	752.9	894.5
S. Darfur	3247	726	18.1	1444.7	1462.8	1738.0
Total	**29952**	**11511**	**104.2**	**8130.4**	**8234.6**	**9783.5**

Figure (1): **Potential Revenue and Potential Needs FY2008 (based on cols. 5 and 6table 1)**



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