CENTER FOR ENERGY ECONOMICS

Bureau of Economic Geology, Jackson School of Geosciences
The University of Texas at Austin

Case Study From

NEW ERA IN OIL, GAS & POWER VALUE CREATION

Chad-Cameroon Oil Pipeline

Chad is one of the poorest countries in the world. Although significant oil reserves have been found in the early 1970s, these could not be developed because: 1- Chad is a landlocked country with limited domestic demand; 2- civil war prevented the creation of a stable investment environment and caused the departure of several investors. Since peace was established in 1990, investors and the World Bank returned to Chad for developing its oil reserves. In order to justify the large investment, access to the world market was sought via a pipeline through Cameroon, which is also a relatively poor country that can benefit from the investment and transit revenues. The World Bank has been supporting natural resource extraction based development around the world and, in particular, in Africa as the primary driver for economic growth and poverty reduction in these countries. But, the Bank has also been heavily criticized for failing to achieve these goals as the revenues from resource development do not reach the majority of the society. With the Chad-Cameroon pipeline and oil development in Chad, the Bank and the companies are following a novel partnership and revenue management approach.

- *How is the project financing different?*
- *How will this new approach work?*
- *Will Chad and Cameroon benefit from this approach?*

Background[1]

Upon getting its independence from France in 1960, Chad has been involved in 30 years of civil war. The peace was finally restored in 1990, and the country drifted towards multiparty democracy, until rebellion broke out again in the north of the country. In January 2002 peace treaty was signed confirming de jure reign of northern ethnicity.

Chad is one of the least developed nations on earth with GNI per capita of around $200. Republic of Chad is ranked 165th of 175 countries in UN's Survival Ranking. The agricultural sector accounts for 36% of Chad's GDP. Cotton exports account for 50% of foreign currency earnings. Chad's government is concerned about this dependence on cotton and wants to diversify its economy in order to mitigate vulnerability associated with volatility of the international price of cotton. Chad's only significant natural resources are oil deposits.

Being independent since 1960, Cameroon has developed a rather stable political system, based on ethnic oligopoly. Despite of vast natural resource base (including oil, natural gas and aluminum) the country is one of the poorest in the world, with GNI per capita of roughly $600 in 2002. According to World Bank classification Cameroon is an HIPC (heavily indebted poor country) with total debt of $4.9 billion and outstanding short-term debt over $950 million. Cameroon is in Top-15 countries with highest HIV rate (around 12%) and in Top-30 infant mortality rate.

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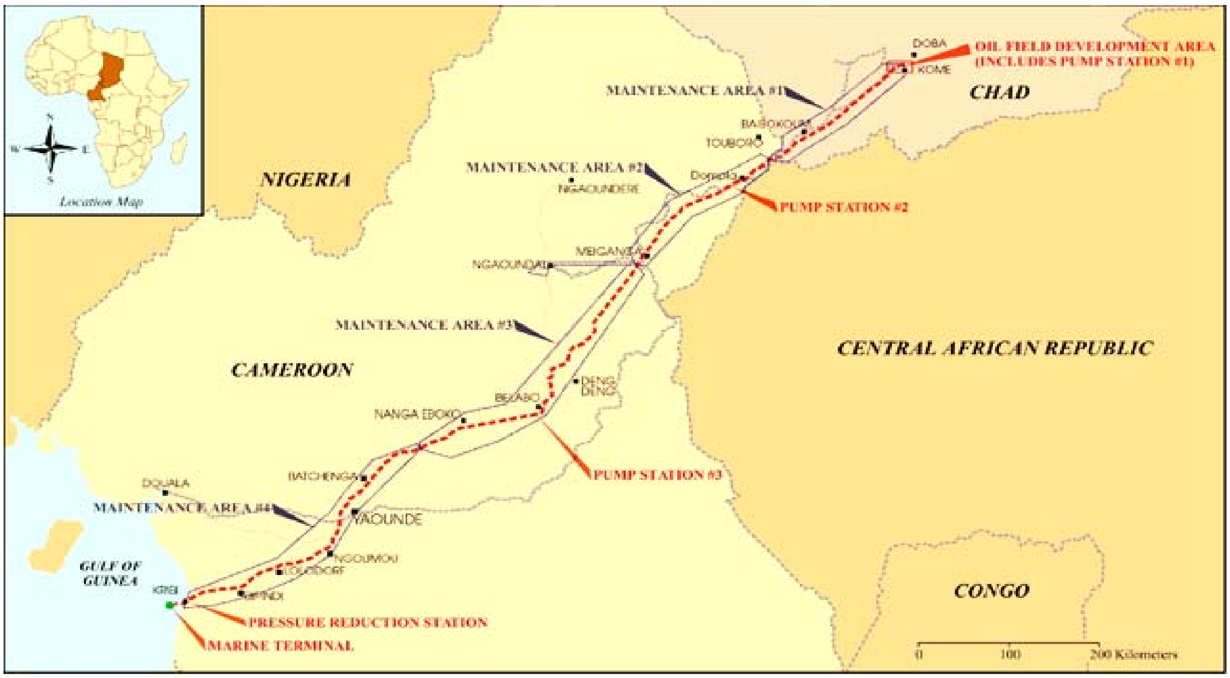
[1] Economic and social development information on this section comes from the World Bank web site, CIA Fact Book, and U.N. Human Development Report.

Since 1990, being faced with a fall in GDP due to unfavorable prices on major exported goods; Cameroon has been engaged in several World Bank and IMF programs, aimed at poverty reduction and acceleration of economic growth. As a result annual GDP growth averaged 2.1% through 1990-2001, compared to 3.4% in 1980s.

Oil Development

Conoco became the first foreign oil company to undertake significant oil exploration in Chad with acquisition of the Chad Permit H concession in 1969. Between 1973 and 1975, oil was discovered in varying amounts in the Doba, Doseo, and Lake Chad basins, that led to the creation of a multinational consortium comprising Conoco (12.5% and operator), Royal Dutch/Shell (37.5%), Exxon (25%), and Chevron (25%).[2] In 1981 all the exploration projects were stopped due to escalating civil war. In 1988 a convention was signed between the government of Chad and the consortium, granting exploration permit with term



of validity until early 2004. Conoco withdrew from the project, and Exxon took over operations, discovering the Bolobo field in 1989 with estimated 135 million barrels of reserves.[3] Chevron, in its turn, sold its share (20% interest in the Block H hydrocarbon license containing the three fields) to Elf Aquitaine, in 1993.[4]

The Project

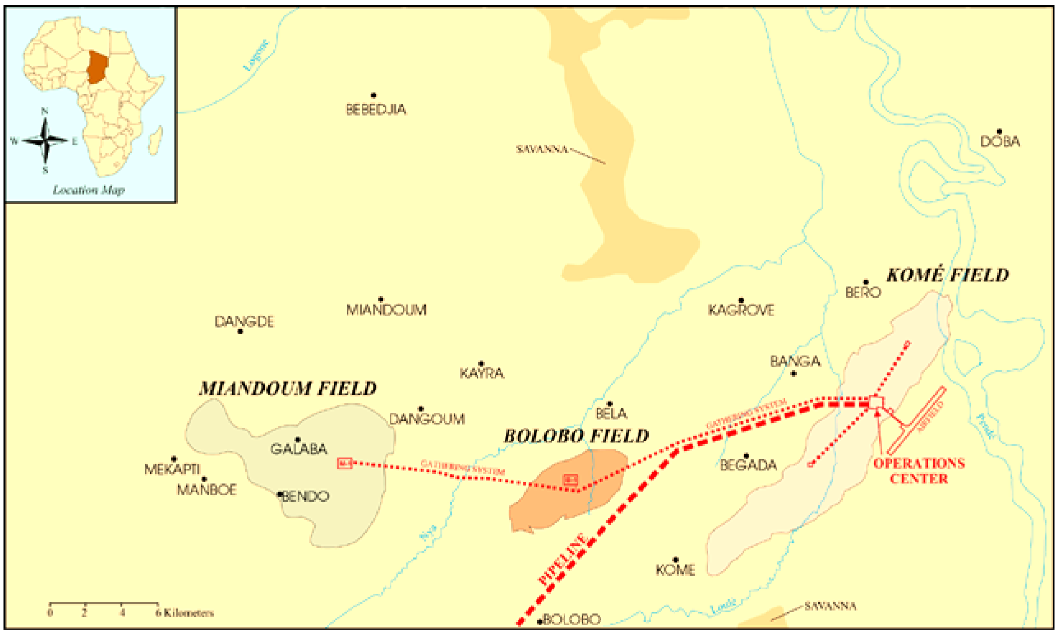
The 1988 convention also provided for a long-term concession (30 years) to develop the oilfields at Doba in southern Chad, to produce and to transport the oil to market in case of success of the exploration effort.

Figure 1. Chad-Cameroon Pipeline Transportation System[5]
Source: http://www.essochad.com/Chad/Project/Overview/Chad_Overview.asp

[2] *Petroleum Economist*, October 22, 1998, p.7.
[3] U.S. Geological Survey Mineral Yearbook 2000; *The Mineral Industry of Chad*, by Philip M. Mobbs, p. 8.2
[4] *Oil & Gas Journal*, Feb. 1, 1993, p. 25.
[5] Source: http://www.essochad.com/Chad/Project/Maps/Chad_Maps.asp

Between 1993 and early 1996 the consortium conducted economic and environmental feasibility studies for oil field development project in Chad, including the construction of a 1,070-kilometer underground pipeline to carry Chadian crude oil across Cameroon to a marine shipping terminal (Figure 1).

In February 1996, Chad and Cameroon agreed to a bilateral treaty that provided for the construction and operation of the pipeline and other oil transportation facilities. Finally, in September 1997 the consortium made up of Exxon Corp., the Royal Dutch Shell Group and Elf Aquitaine has reached an agreement with the governments of the Republic of Chad and Cameroon on the proposed project.



In November 1999 Royal Dutch/Shell and Elf Aquitaine withdrew from the project claiming low oil prices and intense environmental and political controversy.[6] To fill the vacuum Esso Exploration and Production Chad, a wholly owned subsidiary of Exxon Corp. and the Chad government invited several major international oil companies to bid for equity in the project. As a result, in April 2000 Malaysian Petroleum Nazional Berhad (Petronas) and Chevron acquired 35% and 25% stakes in the consortium, respectively.

ExxonMobil, the leading shareholder of the project with 40%, was at that time the largest oil company in the world. The company operated in more than 100 countries with 56 upstream projects and 11 billion barrels of proven reserves.[7] Excellent financial position with AAA debt rating was supported with $185 billion of total revenues and almost $8 billion net income.

Figure 2. Chad Export Project
Source: http://www.essochad.com/Chad/Project/Overview/Chad_Overview.asp

Chevron merged with Texaco six months later, but even by itself its revenues of $35 billion and net income of more than $2 billion made the company one of the major players in the market. The company has exploration and production activities in 31 countries worldwide, including Nigeria, Angola and Congo, and high reliance on upstream business for revenues.

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[6] "Pollution worries mount" by Neil Ford, *African Business*, Jan 2001 p. 33; "Shell and Elf pull out of Chad-Cameroon pipeline" *Drillbits and Tailings*, Volume 4, Number 19, November 23, 1999.
[7] "Government owned vs. private company liquids reserves." *Oil and Gas Journal*, Oct.23, 2000.p.75.

Petronas, Malaysia's national petroleum corporation was established on 17 August 1974 and vested with the entire oil and gas resources in Malaysia. In 1999, the company had revenues of $16 billion and proven reserves of 3.4 billion barrels. Operations in 24 countries worldwide, including upstream project in Sudan, generated $3.3 billion net profits, showing the company's big potential.

Project Details

Project, total costs of which exceed $3.7 billion, consists of two major parts (Table 1):

- Field System, of total costs over $1.5 billion, is aimed to develop of Chad's Doba oil fields (Figure 2), including drilling of about 300 wells and construction of associated facilities and infrastructure;
- Export System, estimated at $2.2 billion, includes the construction of a 670-mile, 30-inch pipeline (1,070 km, 760 mm), from the Doba oil fields to Cameroon's Atlantic coast at Kribi (buried to about 1 m of depth), three related pumping stations, ancillary facilities and infrastructure improvements, and the installation of an offshore floating storage and offloading vessel and related facilities, plus an 11-km submarine pipeline from the Atlantic coastline to the vessel (Figure 1).

The Field System is owned and financed by unincorporated field production joint venture, also known as Upstream Consortium. Esso Exploration and Production Chad, Inc. (EssoChad) - a wholly-owned subsidiary of ExxonMobil is the Consortium's operator, as well as Project's Manager and System Operator (see Figure 3 for the corporate structure).

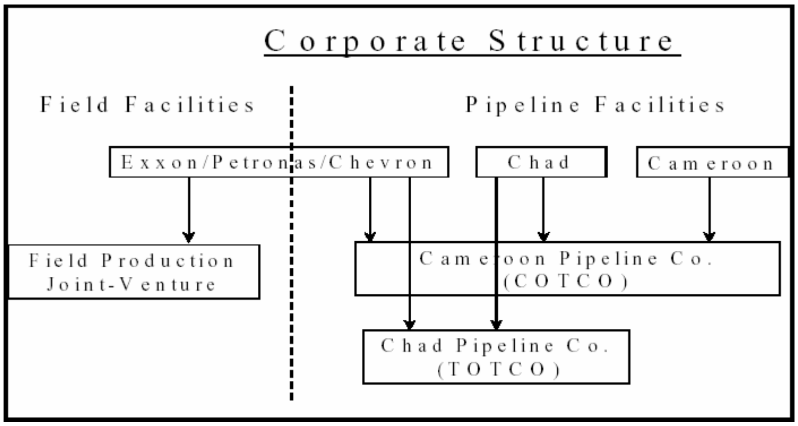
Table 1. Estimated Project Costs (in million US$) (Net of Taxes and Duties)

	Local	Foreign	Total	IBRD
FIELD SYSTEM				
Development Drilling, Surface	43	1054	1097	
Logistics, Railroad Tariffs, Roads	16	143	159	
Project Management	7	96	103	
Operator & Start-up Costs	8	154	162	
Total Financing Required	**74**	**1,447**	**1,521**	
EXPORT SYSTEM				
Pipeline Installation, Offshore Facilities, Pipe Line	37	987	1024	7%
Railroads Upgrades, Logistics, Storage, Roads	26	253	279	
Project Management	8	94	102	
Operator and Start-Up Costs	8	154	162	
Total Export System Project Costs	**79**	**1,488**	**1,567**	
Interest During Construction and Other Financial Costs	-	458	458	
Debt Service Reserve Funding	-	177	177	
Total Financing Required	**79**	**2,123**	**2,202**	
FIELD EXPORT SYSTEM				
Total Financing Required	**153**	**3,570**	**3,723**	
PROJECT PREPARATION COSTS				
Chad	3	4	7	
Cameroon	6	2	8	
PROJECT GRAND TOTAL	**162**	**3,576**	**3,738**	

Source: *Project Appraisal Document* available at www.worldbank.org/afr/ccproj/pro_document.htm

Chad’s and Cameroon’s parts of Export System are owned by Chad Oil Transportation Company (TOTCO) and Cameroon Oil Transportation Company (COTCO) accordingly. TOTCO is a special-purpose company incorporated in Chad as a joint-venture between the Upstream Consortium and Government of Chad; COTCO is a special-purpose company incorporated in Cameroon as a joint-venture between the Upstream Consortium and both Governments of Chad and Cameroon.

Figure 3



The infrastructure construction began in October 2000. Oil production in Chad began in June 2003; and oil started flowing through the new pipeline in July 2003, but the project was formally inaugurated on October 13th, 2003. Commissioning of the final facilities needed to reach full production began in the first quarter of 2004 with peak production level expected in 2006.

Source: *Annex 11* available at www.worldbank.org/afr/ccproj/pro_document.htm

Project Financing

It was decided to apply corporate finance to Field System and project finance for the Export System. The project’s private sponsors (upstream consortium) financed about US$2,206.4 million or 95% of total equity. About US$600 million in debt financing for the export system has been obtained by the sponsors from export credit agencies and commercial banks (Table 2). The World Bank’s private sector affiliate, the International Finance Corporation (IFC), provided an A loan of US$100 million (US$85.8 million to COTCO and US$14.2 million to TOTCO),[8] about 7.1% of the total debt, and has mobilized another US$300 million (for COTCO and TOTCO) in commercial lending under a B loan umbrella.

Table 2. Corporate Structure/Financing Plan (US$ million)

	Upstream (Field System)		Downstream (Export System)					
			COTCO		TOTCO		Total	
Source	US$	%	US$	%	US$	%	US$	%
Equity								
Private Sponsors	1,521.4	100.0	575.9	84.7	109.1	89.0	685.0	85.4
Chad	-	-	34.0	5.0	13.5	11.0	47.5	5.9
Cameroon	-	-	70.0	10.3	-	-	70.0	8.7
Total Equity	1,521.4	100.0	679.9	100.0	122.6	100.0	802.5	100.0
Debt								
ECAs/Commercial Banks	-	-	514.7	42.9	85.3	42.9	600.0	42.9
Capital Markets Bond Issue	-	-	343.1	28.6	56.9	28.5	400.0	28.6

8 http://www.worldbank.org/afr/ccproj/project/pro_overview.htm

IFC A Loan	-	-	85.8	7.2	14.2	7.1	100.0	7.1
IFC B Loan	-	-	257.3	21.5	42.7	21.4	300.0	21.4
Total Debt	-	-	1,200.9	100.0	199.1	100.0	1,400.0	100.0
Grand Total	**1,521.4**		**1,880.8**		**321.7**		**2,202.5**	

Source: *Annex 3* available at www.worldbank.org/afr/ccproj/pro_document.htm

The World Bank Group provided US$92.9 million in IBRD loans (US$39.5 million to Chad and US$53.4 million to Cameroon, amounting to about 3% of project costs), for financing the two governments' minority holdings in the joint-venture pipeline companies (last column of Table 3). The European Investment Bank (EIB) is providing US$46.6 million to finance Chad and Cameroon's equity in the two joint-venture oil companies, TOTCO and COTCO (US$17 million and US$29.6 million, respectively).

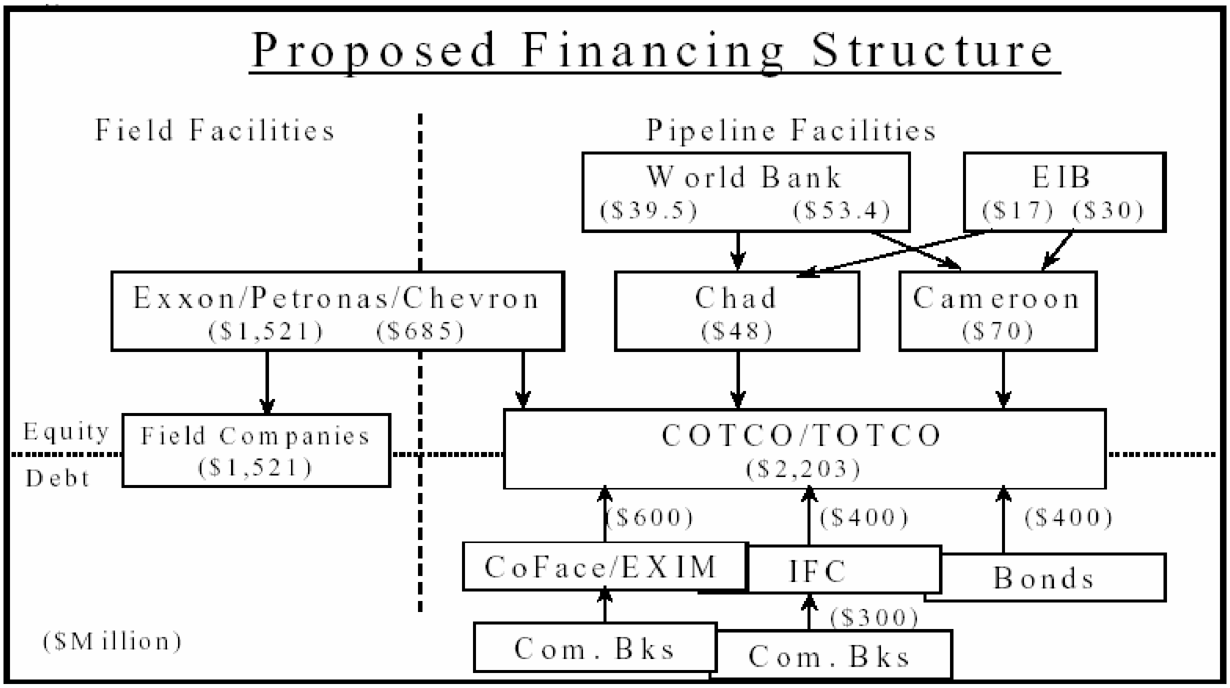
Table 3. Government Borrowing (US$ million)

	Equity						
Source	TOTCO	COTCO	Total	IDC/Com*	Subtotal	Unallocated	Grand Total
Chad							
IBRD	8.5	24.0	32.5	3.5	36.0	3.5	39.5
EIB	5.0	10.0	15.0	2.0	17.0	0.0	17.0
Total	13.5	34.0	47.5	5.5	53.0	3.5	56.5
Cameroon							
IBRD	-	43.5	43.5	9.9	53.4	-	53.4
EIB	-	26.5	26.5	3.1	29.6	-	29.6
Total	-	70.0	70.0	13.0	83.0	-	83.0
Chad + Cameroon							
IBRD	8.5	67.5	76.0	13.4	89.4	3.5	92.9
EIB	5.0	36.5	41.5	5.1	46.6	0.0	46.6
Total	13.5	104.0	117.5	18.5	136.0	3.5	139.5

Source: *Annex 11* available at www.worldbank.org/afr/ccproj/pro_document.htm

* IDC/Com: Interest during construction, and commitment and other charges, including, in the case of Cameroon, the US $5.34 million premium (See discussion of IBRD loan in Section C.6).

Figure 4.



Source: *Annex 11* available at www.worldbank.org/afr/ccproj/pro_document.htm

At the request of both governments, COTCO and TOTCO were to explore issuing bonds on the international capital markets of about US$ 400 million in total. Both series of bonds will have the same rights and privileges as another series of equity with the other senior loans made to the pipeline companies, namely by IFC and under the coverage provided by the export credit agencies. The bonds were expected to be floated by end-2001. In the event that the bond offering fails to meets its US$ 400 million target, the private sponsors would provide additional equity funds to fill any financing gap.[9]

The bond issue provides two main benefits: it reduces the need for equity financing from the two governments, by generating more debt financing; and it was planned to be a vehicle to provide for formal recognition by and official ratings from international capital markets and rating agencies, and would support efforts to attract foreign investment.

Financial Projections

In the World Bank base case, the sales are based on a Brent oil price of $15.25/bbl in 1999 dollars (consistent with the World Bank's January 2000 oil price projections), adjusted downward to an average price of about $13.50/bbl to take account for quality, marketing and transportation.[10] In this case they used proved plus probable reserves (representing 917 million barrels of oil) produced over a 28- year period, which results in the shipment through the pipeline of about 883 million barrels -- the rest being used for field operations. The NPV of the revenues of the project as a whole is US$ 1,313 million, and the rate of return is 19% (Table 4).

[9] Project Appraisal Document, p. 16 available at www.worldbank.org/afr/ccproj/pro_document.htm.
[10] Due to relatively low sulfur content, but a high acidity of crude oil in Doba Basin, specialists predicted it would sell with a US$2.3 – 3.5/bbl discount to Brent. A Doba crude valuation study was carried out by an independent consulting firm, Scientific Software-Intercomp (U.K.) Ltd (SSI). (Project Appraisal Document, p. 27 available at www.worldbank.org/afr/ccproj/pro_document.htm)

The sensitivity analysis for the project as a whole demonstrated that the project was less sensitive to changes in capital costs than to oil price and reserve levels:

- A 20% increase in project capital costs reduces the NPV to US$ 1,038 million and the rate of return to 17%.
- A drop of about 20% in crude oil prices produces an NPV of US$ 404 million and a rate of return of about 13%.
- A drop of about 20% in reserves (to 701 million barrels) would decrease the project's NPV to US$ 549 million and the rate of return to 14%.

Table 4. Scenario Analysis (NPV in millions of 1999 US$ @ 10% and IRR in %)

	US$12.00		**US$15.25**		**US$18.50**	
	NPV	**IRR**	**NPV**	**IRR**	**NPV**	**IRR**
595 million bbls *						
Chad	108	42	205	60	330	75
Cameroon	92	34	104	35	101	35
Private Sponsors	(917)	<0	(344)	<0	235	13
917 million bbls **						
Chad	271	56	463	70	822	84
Cameroon	148	39	144	39	141	39
Private Sponsors	(98)	9	706	18	1,361	25
1038 million bbls						
Chad	337	60	603	75	1,170	90
Cameroon	162	41	158	40	156	40
Private Sponsors	198	12	1,045	21	1,614	27

Source: Attachment 1 to Annex 4 available at www.worldbank.org/afr/ccproj/pro_document.htm.
* IFC base case
** World Bank base case, Project Appraisal Document, pp. 23-24, www.worldbank.org/afr/ccproj/pro_document.htm

The probability/risk analysis showed that there is a 50% chance that the NPV will exceed US$ 1,251 million and a 30% chance that it will exceed US$ 1,537 million. Similarly, the estimated probability distribution of the rate of return shows a 50% chance that the IRR will exceed 18% and an 80% chance it will exceed 15%.

Figure 5. Project's NPV Forecast

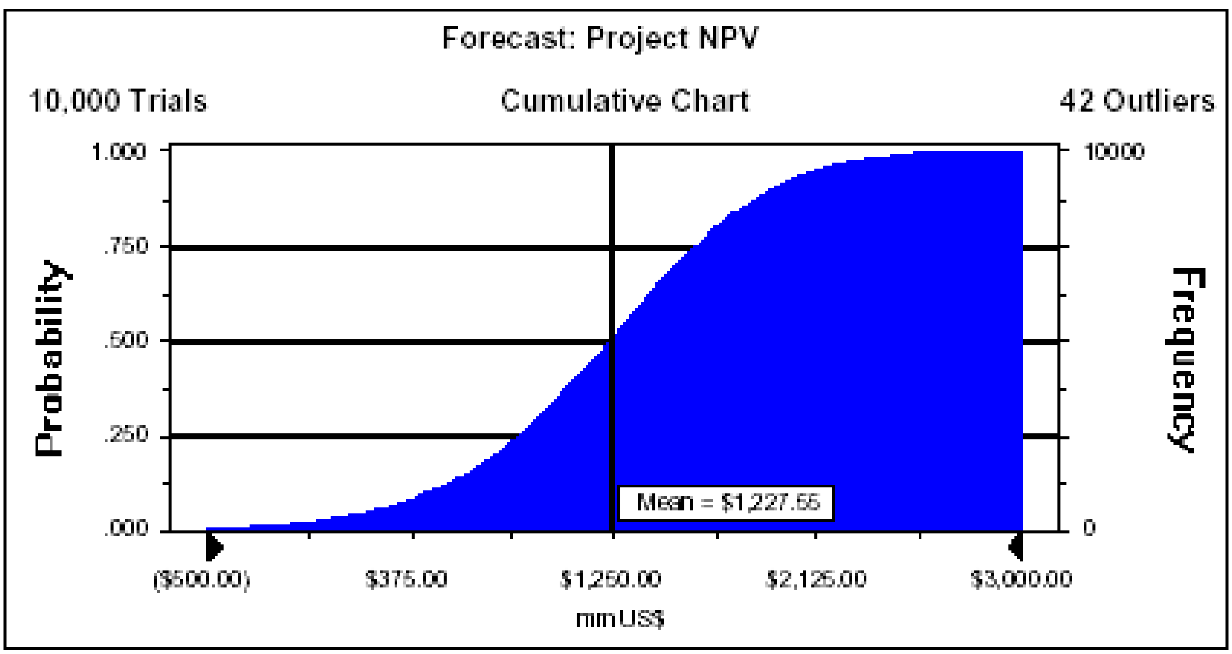
Source: Annex 4 available at www.worldbank.org/afr/ccproj/pro_document.htm

World Bank Group Role

The World Bank Group plays a catalytic role in mobilizing private sector financing for large capital intensive projects by mitigating political risks, in particular for investments in countries without a pertinent track record, and where the project is dependent on transporting the goods across a specified neighboring country. Some of the major projects the Bank has been involved ininclude financing of the Bolivia-Argentina Gas Pipeline Project in 1973, the Second Natural Gas Pipeline Project in Tunisia in the mid 1980s, the Bolivia-Brazil Gas Pipeline Project in 1997, and IFC financing in 1998 of the Azerbaijan-Georgia Early Oil Project. Usually, the Bank provides a small amount of financing to governments and sometimes the companies to alleviate some of the risk factors.

It has been the same with the Chad-Cameroon pipeline. IFC and the Bank supported stability of the project's arrangements and operation, and played a critical role in a project involving cooperation between two governments and three international oil companies. The Bank's support catalyzed the involvement of the private sponsors, who stated their unwillingness to proceed without the Bank's participation, indicating the significance they attach to the mitigation of political risks provided by the Bank's involvement. The Bank involvement was also crucial to catalyze the $900 million in financing from commercial lenders/ECAs (including IFC's B-Loan), who also indicated their unwillingness to proceed without the Bank, and the $400 million bond issue.

Over the years, the Bank has been criticized for funding extractive industries without due diligence on their environmental and social impact in the societies in which they are developed. Increasingly, a group of NGOs have complained about the corruptive nature of economic rents from these projects. Local communities started to become more vocal as well. In response, the Bank implemented more stringent processes to evaluate environmental and social impact of extractive industry projects. A satisfactory performance



of these reviews are now required before financing or support of the Bank can be secured.

Chad-Cameroon pipeline demonstrates this newer approach by the World Bank, which has helped to raise the standard and quality of the environmental assessments and the mitigation plans, including significant adjustments to project design. The World Bank defined "a key objective of the Capacity Building Project, and a major rationale for the Bank's involvement in the Project, was to develop and strengthen the institutional capabilities of the Government to a level where it could manage the petroleum sector in environmentally and socially sound manner. This included increasing the government's capacity to the point where it could begin to monitor the Project effectively before the revenues start to flow."[11]

Most importantly, the Bank together with the Chad Government involved initiated a "revenue management plan" in order to prevent corruption and waste of the project revenues, and ensure their use for poverty reduction, and development needs of the country with a special focus on local communities. According to the program, petroleum revenues are to be channeled through project offshore escrow accounts, audited by an independent Revenue Oversight Committee, including representatives of the government, parliament and civil society.

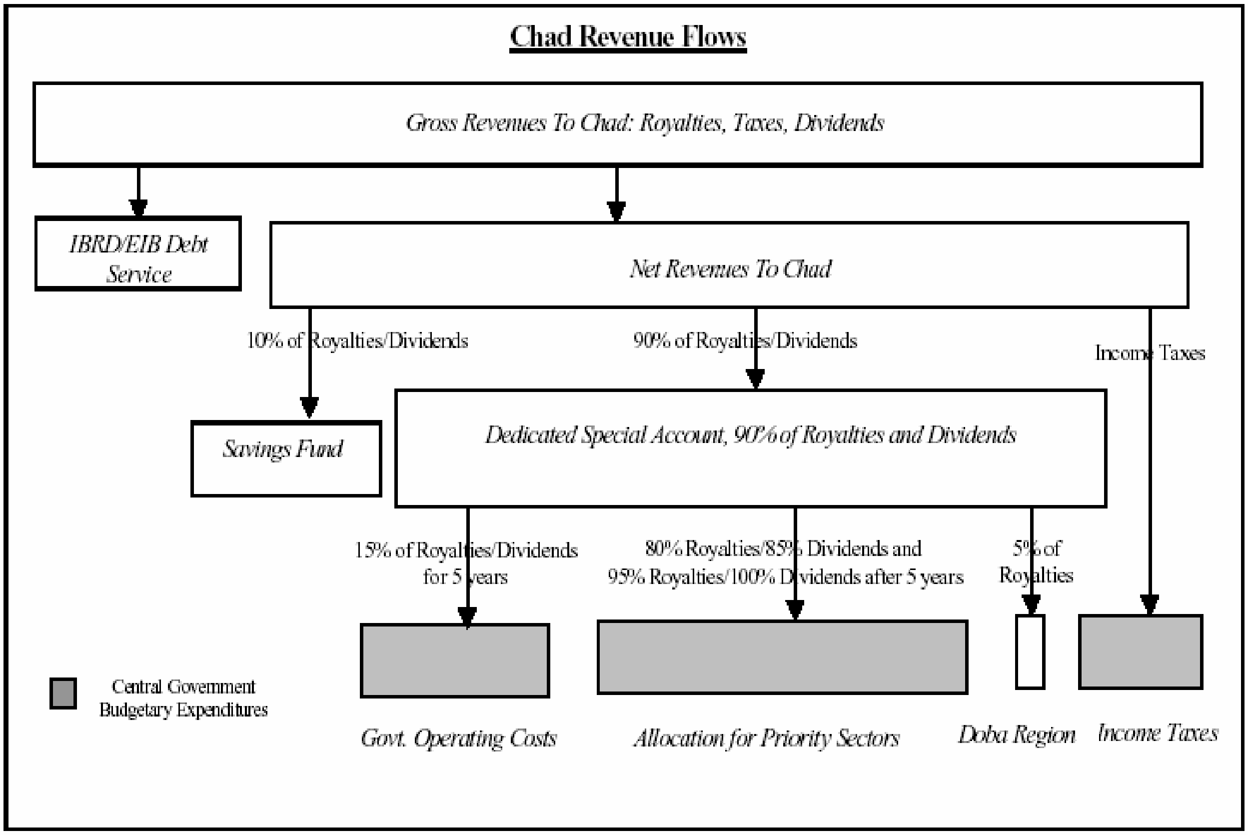
Ten percent of royalties and dividends (representing about 85 percent of expected revenues over the first ten years of production) are to be invested with an external financial institution in long-term investment instruments, representing the "Future Generations Fund." The Government of Chad passed a law saying that 80 percent of royalties and 85 percent of dividends deposited into the Special Petroleum Revenue Accounts (special Treasury accounts held in one or two private commercial banks in Chad) will be used to finance education, health programs, infrastructure, water management and rural development. Income taxes on the oilfield operations (which begin accruing around the seventh year of production or thereafter, depending in part on oil prices) and on the pipeline company TOTCO will be used to support increased development expenditures in the Doba oil-field area (Figure 6).[12]

[11] The World Bank Group. The Inspection Panel Investigation Report Chad-Cameroon Petroleum and Pipeline Project (Loan No. 4558-CD); Petroleum Sector Management Capacity Building Project (Credit No. 3373-CD); and Management of the Petroleum Economy (Credit No. 3316-CD). p. 11
[12] The World Bank. Chad/Cameroon Petroleum Development and Pipeline Project, April 13, 2000. Annex 11. pp. 95-99.

In addition, during an initial five-year period (i.e., before oilfield income taxes provide another possible source of revenues), the residual 15 percent of royalties and dividends could used to finance general Government expenditures in the civil sectors to meet pressing operational needs; after that, this portion will be added to the 80 percent of royalties and 85 percent of dividends used to finance the priority poverty reduction sectors.

Figure 6.
Source: Annex 11 available at www.worldbank.org/afr/ccproj/pro_document.htm

In November 2003, a month after official inauguration of the pipeline, the government of



Chad received the first $6.5 million (compared to $198 million total revenues of Chad's budget),[13] deposited by Consortium in a London-based escrow account. In December 2003 the Government approved its first budget incorporating oil revenue and submitted it to the Revenue Management College.[14] Chad's 2004 budget includes $100 million in revenue form the project, which is expected to help produce economic growth of 40%.[15, 16]

There are some doubts that some of these goals have been achieved so far. The Bank's investigations revealed "the lack of human and institutional capacity at the national level to

[13] Estimate for 1998. http://www.odci.gov/cia/publications/factbook/geos/cd.html
[14] Oil Wealth Trickles Into Chad, but Little Trickles Down; Five Months After Opening of Pipeline to Cameroon, Locals Await Benefits and Crime Rate Rises. *The Washington Post*, March 13, 2004.
[15] THE NATION; Chad Sees First Trickle of Cash From Pipeline; Project's proponents, including the U.S. government, say it will transform the nation. Critics fear the money will be squandered. Los Angeles Times. December 26, 2003
[16] According to other sources, $110 million. Source: A new model? Oil & Gas Journal. February 2, 2004

manage and monitor projects of this magnitude and complexity."[17] The Bank specialists were also "unable to find any analysis to justify the allocation of revenues among Chad, Cameroon and the Consortium", that raised concerns about "the adequacy of the allocation of revenues" to participating governments.[18] There were no World Bank policies and procedures that directly guided the allocation of resource revenues to producing regions in Chad and Cameroon, as well as obvious evidence that "there is sufficient communication and coordination between the two projects to rule out the possibility of their becoming poverty-increasing problems which fall between two stools and fail to be identified and addressed."[19]

Before the Revenue Oversight Committee began operations, the government used $5 million of a $25-million bonus from the oil consortium to purchase weapons. A government audit found that the regime routinely used the bonus for purchases made "contrary to the law of public procurement." It also spent about $478,000 to import 35 Peugeot automobiles from France for members of the regime. Other expenditures paid for catering and lodging for an educational conference and to renovate the Ministry of Foreign Affairs. The head of the National Assembly was given $41,000 to be used at his discretion.[20]

There are also doubts about the committee's long-term effectiveness. Institutions close to the Chadian government appoint five of the committee members. Independent groups appoint the remaining four. All the current members have full-time jobs, and the committee must review thousands of government spending requests every year. Also, there seems to be no local authority to receive the funds that are earmarked for local communities.

That the regime of President Idriss Deby would squander oil money and fail to deliver promised political and economic reforms has been a concern for many Chadians and outside observers from the beginning. The purchase of weapons and cars seemed to justify such fears. In September 2003, the government banned a peaceful protest against the pipeline by human rights groups. A month later, the Public Security Ministry suspended Radio FM Liberte, an independent station with close ties to rights groups, after it broadcast a report critical of the president. At the same time, the president appointed his nephew prime minister and his political party announced a plan to overturn a constitutional provision that bars presidents from serving more than two terms. The president's party controls more than the two-thirds majority in parliament needed to alter the constitution.[21]

[17] The World Bank Group. The Inspection Panel Investigation Report, Op. cit. p. 11
[18] Ibid. p. 17
[19] Ibid. p. 19
[20] Chad Sees First Trickle of Cash From Pipeline, Los Angeles Times, December 26, 2003
[21] Chad Sees First Trickle of Cash From Pipeline, Los Angeles Times, December 26, 2003