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URANIUM AND THE NIGERIEN ECONOMY

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URANIUM AND THE NIGERIEN ECONOMY

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URANIUM AND THE NIGERIEN ECONOMY

Introduction

Uranium has probably been the single most important element of change in both the structure and the potential of Niger's economy. It has spear-headed growth in recent years and is viewed as having the capability of transforming Niger into a self-sustaining vital economy. Although in a strict economic sense the direct effects of uranium mining have been limited to the construction services and transportation sectors, the indirect effects on the economy - most notably the increased availability of financial resources for investment purposes - have been significant.

Given the finite nature of the mineral resource, it will be these indirect effects which will have the most long term impact upon the economy. Official statements which have singled out uranium as the engine of economic growth, have also underscored the necessity of channeling the revenues derived from uranium into productive, renewable sectors of the economy. It is only in this way that the country will be able to achieve self sustaining growth in the long-term.

The rapid increase of mining sector activities has already wrought a great deal of change upon the Nigerien economy. With substantially increased activity in the mining sector planned over the next decade, these changes will probably be even more rapid and more decisive. Uranium has opened up a new development perspective for Niger, and has enabled the government to undertake activities that otherwise would not have been possible. But the realization of this country's development potential will depend on careful planning in order to accomodate and initiate constructive structural change. It will also depend upon the judicious use of uranium revenues as well as continued donor assistance in order that long term self-sustaining development be made possible. The appropriate rate of exploitation and of investment as well as absorptive capacity and availability of human resources will be among the important considerations for the Nigerien Government.

This report will examine the general characteristics of the uranium industry in Niger put into the context of the world uranium situation. Existing and planned mining operations as well as production and price trends will be discussed. The second section will examine the impact of uranium in the Nigerien economy, focusing on gross domestic product, balance of payments, public finance and investment, and linkages with other sectors of the economy.

A. General Characteristics of the Uranium Industry

I. Uranium in Niger

Uranium in Niger is found in sandstone-type deposits which are located primarily in the northern part of the country on the southern and western borders of the Air Massif.* The Air Massif runs approximately 250 miles from north to south and 150 miles from east to west at its widest. The ore which contains only some 3 kg of metal per ton is transformed into uranium concentrate (also known as U_3O_8 or "yellow cake") containing 70 percent uranium metal. With resasonably assured resources amounting to 74,000 tons and additional resources estimated at 86,000 tons,** Niger ranks eighth in the world after the U.S., Canada, South Africa, France, Australia and Spain. Annual production in 1978 was approximately 2100 tons and by 1985 it is estimated that annual production will reach 9000 tons, ranking Niger fourth as uranium producer in the non-centrally planned economies.

The discovery of uranium in the late 1960s by the French Atomic Energy Commision (CEA) came after more than ten years of research and exploration. The first deposits, with an estimated 20,000 tons of uranium metal, were located in the Arlit region of the Air Massif. In early 1968, the Societe des Mines de l'Air (SOMAIR) was created to exploit these deposits, and production began in 1971 with an initial output of 410 tons. Since then mining activities have expanded significantly. The second mining company, COMINAK, started production in 1978 and three other mines are expected to begin production by 1985. In addition approximately fifteen research and exploration permits have been granted. All the deposits are located in the Air Massif save two which are in the northeastern Djado region.

Mining concessions were originally granted to consortiums of international companies. SOMAIR and COMINAK, which started production in 1971 and 1978 respectively, involve a total of nine different partners representing six countries. However, many of the planned mining activities are being negotiated between Niger and single companies. In December 1974, Niger renegotiated its participation in SOMAIR, creating a state uranium company URANIGER which was to be responsible for exploration, exploitation and marketing of uranium. In practice, its role was somewhat more limited, involving primarily negotiating for the Niger Government and auditing uranium revenues.

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*See Map

**According to the IAEA: - Reasonably Assured Resources refer to uranium that occurs in known mineral deposits of such size, grade and configuration that it could be recovered within the given production cost ranges, with currently proven mining and processing technology.
- Estimated Additional Resources refer to uranium in addition to Reasonably assured Resources that is expected to occur, mostly on the basis of direct geological evidence.

URANIGER's equity participation was initially small (16.75%) but it has since been increased to as high as 50 percent for some mining operations.

In 1976, the Office des Ressources Minieres du Niger (ONAREM) was created to manage Government interests in all mining operations subsuming the previous responsibilities of URANIGER and OFREMIG (research). ONAREM's equity participation in current and planned mining ventures ranges between 31 and 50 percent. In theory, ONAREM has the right to claim its share of output corresponding to the equity participation and to sell it at remunerative prices. Until 1976, however, marketing was entrusted to the Compagnie Generale des Matieres Nucleaires (COGEMA), a 100 percent owned subsidary of the French Atomic Energy Commission (CEA). Recently, ONAREM has started marketing a small amount of uranium by itself and has plans to market a full 50 percent of the uranium produced by the Tassa N'Tagalgue mine scheduled to begin operations in the early 1980s.

II. Government Policy

The Government of Niger is currently preparing a comprehensive five year development plan for the period 1979 through 1983. Given the key role of uranium in the national economy, one of the major tasks of the commissions undertaking plan preparation will be to develop a coherent mining policy to define the legal, economic, financial, political and social aspects of mining operations.

General government policy on mineral development, particularly as it concerns uranium is cognizant of the fact that uranium resources are finite and that uranium must be seen as a catalyst for change rather than a definitive solution to the country's problems. As such the revenues derived from uranium must be used in a manner which would develop a self-sustaining economy. Preliminary Plan documents suggest the following as government policy for uranium development:

- -- Strengthen the ability of Niger to prospect, exploit and market mineral resources;
- -- Increase participation of nationals in all mining operations;
- -- Channel revenues derived from uranium into productive sectors of the economy in order to improve the quality of life;
- -- Create an industrial base which could assure economic independence;
- -- Improve working and living conditions of those involved in mining operations;
- -- Diversify foreign partnership;
- -- Ensure optimal rates of mineral exploitation in accordance with the country's financial needs and absorptive capacity for investment.

Uranium production has expanded rapidly since mining operations began in 1971. The chart below gives production and export figures and projections through 1983. These projections assume SOMAIR and COMINAK through 1981 to be joined by Tassa N'Tagalgue and Teguida n'Tessoum in 1982/1983; Immouraren is expected to begin production in 1984/85.

Table 1

(tons uranium mental)

	1971	1972	9173	1974	1975	1976
prod.	410	867	948	1116	1306	1460
export			1090	1250	1400	1500
	1977	1978	1979	1980	1981	1982
prod.	1440	2061	3600	4300	4500	4845
	1464	2200	3550			
	1983					
prod.	6635					
export						

Note: 1) Figures on projected production vary considerably depending on the source
2) Differences in production and export figures are due to:
- catch up from first two years of limited or no exports.
- different sources for production and export figures.

III. Government Revenues

For Niger the revenues derived from uranium will continue to be substantial even if the price of uranium does decrease in real terms. Revenue is derived from uranium by means of various taxes applied to uranium mining at different stages of production and exportation. Profits before distribution (Benefices Industriels et Comerciaux) are taxed at 40.5 percent; dividends and other products distributed to foreign shareholders are taxed at 16 percent; royalties are proportional to production at 4.5 percent; and uranium concentrates are taxed at a rate of 1 percent of their export value. In addition, Niger receives dividends equal to ONAREM's equity participation in the various mining companies. ONAREM's equity share in SOMAIR was increased to one third in 1975, while that in COMINAK was set at 31 percent. It is expected that ONAREM will have 50 percent equity participation in the Tassa N'Taghalgue mine and in the Teguida n'Tessoum mine, scheduled to begin operations in 1982/83. A more complete discussion on tax revenue follows in the section on the effects of uranium on public finance and investment.

Table 2

Fiscal Revenue Derived From Uranium
(CFAF million)

	1974	1975	1976	1977
BIC	750	1,900	4,110	5,822
IRVM		93	828	1,043
Royalties	195	557	934	1,265
Export Tax	64	128	207	283
Dividends		800	1,500	2,152
TOTAL	1,009	3,478	7,579	10,565

Source: Ministere des Finances

Notes : BIC - Benefices Industriels et Commerciaux (profits tax) 40.5 percent

IRVM - Impots de Revenues sur Valeurs Mobiliers (dividends distributed to shareholders) 16.0 percent

Export Tax - 1.0 percent of export value of uranium concentrates

Royalties - Proportional to production at 4.5 percent

IV. World Supply and Demand

As with other mineral commodities, the price for uranium is highly dependent upon world supply and demand factors. On the supply side, there are physical constraints. These include limitations on rates of ore production as well as decreasing grades of ore whose use would depend on factors such as processing costs and environmental concerns. There are also political constraints--for example government policy which sets production at levels to satisfy domestic needs, or those policies which aim at restricting exports to countries which meet specific safeguard concerns. Other factors affecting supply would include costs of production, technological constraints, environmental concerns and interrelated with these, the general uncertainty regarding the future use of nuclear power. This uncertainty is also a dominant factor on the demand side of the equation, given the growing influence of the anti-nuclear lobby. Nuclear energy however is seen by many as the future energy path (and as the only significant option to meet energy needs in the next 10-15 years); industrialized and developing countries alike are hoping to develop nuclear energy as a substitute for fossil fuels.

World prices for uranium have responded to increased demand (particularly after the oil price increases in 1973 and 1974) and to costs of production. Since 1974 prices have risen threefold, reaching approximately $104/kg in 1977. It should be noted that there is substantial fluctuation around this price, depending on the nature of the transaction. Per unit prices for uranium in Niger have also risen dramatically in the past five years. When production began in 1971, France dominated Niger's mining sector activities and was able to unilaterally set the price; consequently, through 1974, the price remained below CFAF* 5000 per kilogram. Spurred on by the massive increases in the price of oil, Niger renegotiated the agreement with France concerning pricing and equity participation. Uranium prices are now subject to negotiations between the Nigerien government and the purchasers of the uranium who are the shareholders in the mining companies. The most rapid price increase occurred between 1974 and 1975 when the unit price doubled from CFAF 5000 to CFAF 10,000. Between 1975 and 1977 the price increased on average by a third each year. After a more rapid price jump in 1977, the rate of increase has slowed considerably. The estimated 1979 price is CFAF 24,300/kg.

Price projections are somewhat hazardous, as noted above, and depend heavily on one's underlying assumptions. As reported in Resources, Production and Demand (OECD/IAEA December 1977), there are a variety of opinions on the matter. One is that the supply of uranium over the medium term will come from already identified resources so that future price increases will follow normal inflationary trends. Another is that high costs of exploration, production and processing will increase faster than inflation creating even higher uranium prices.

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*The CFA franc shared by member countries of the West African Monetary Union. As of October 1979, $1.00 - CFAF 206.

Niger is not a party to the Non Proliferation Treaty (NPT) although is a member of the International Atomic Energy Association (IAEA).

V. Existing Mining Operations:*

1. SOMAIR (Societe des Mines de l'Air)

The Societe des Mines de l'Air was created February 1, 1968 to exploit an area of 19 square km in the Arlit region, estimated to have reserves of 20,000 tons. Ther ore zone is 20-25 meters thick and lies at a depth of 40-60 meters beneath rock overburden. When it is mined, the ore averages about 0.3 percent uranium; it is then transformed into concentrate form which averages about 70 percent uranium metal. Off-grade ore is treated with sulfric acid leach in order to recover a portion of its uranium content.

Output in 1971, the first year of operations, amounted to 410 tons; since then annual production has increased rapidly. Between 1971 and 1979, it is estimated that the Arlit mine produced close to 10,000 tons of uranium metal. The production target for 1980 and the mine's full capacity is estimated at over 2300 tons. It is expected that the mine will contiue producing through the 1980s. Total investments through 1978 totalled some CFAF 21.0 billion. These are expected to reach CFAF 45.0 billion by 1982.

When SOMAIR was created, the capital of CFAF 2,700 million was divided among Niger-20 percent; CEA-40 percent; Pechiney-Mokta-20 percer and CFMU-20 percent. Since that time, several changes have occurred in the numbers of companies represented and the relative equity shares of the partners. As of 1976, the shareholders in SOMAIR are the followi

- ONAERM (Niger): 33 percent
- COGEMA (France):26.9 percent
- Mokta (France): 7.5 percent
- Minatome (France): 7.5 percent
- CFMU (France): 11.8 percent
- Urangesellschaft (Germany): 6.5 percent
- Agip Nucleair (Italy): 6.5 percent

The adjoining factor has the capacity to process 2500 tons of uranium metal annually.

2. COMINAK (Compagnie des Mines de l'Akouta)

The Compagnie des Mines de l'Akouta was formed in June 1974 to exploit an area of 9.9 square km with estimated reserves of 44,000 tons. The ore from the Akouta mine averages 0.45% uranium and is located at a depth of 250 meters. Unlike Arlit which is an open pit mine, Akouta

*Note: See Glossary, in Annex

is an underground mining operation. Initial output in 1978 amounted to 500 tons and is expected to reach it's peak of 2200 tons by 1980.

Initial investment amounted to CFAF 46.0 billion; this is expected to increase to CFAF 55.0 billion by 1982. COMINAK's capital amounts to CFAF 3.5 billion divided in the following manner:

- ONAREM: 31 percent
- COGEMA: 34 percent
- OURD (Japan): 25 percent
- ENUSA (Spain): 10 percent

The mining operations of SOMAIR and COMINAK have had important regional economic effects. The towns of Arlit and Akouta for the miner workers and their families have become important markets for local products, and have accelerated the provision of public services. In addition several training centers have been set up as has a national mining school "Ecoles des Mines de l'Air". The construction of a coal-fired power plant by the Societe Nigerienne du Charbon (SONICHAR) and the "uranium road" - a road from Tahoua to Arlit - are two other important effects of activities in the mining sector. (See B4 for details).

VI. Planned Mining Operations (through 1985)

3. SMTT (Societe Miniere de Tassa N'Tagalgue)

The Societe Miniere de Tassa N'Tagalgue will be exploiting the Arni deposit in the COGEMA concession of Arlit. The known reserves in this deposit are on the order of 20,000 tons. The ore is situated at a depth of 50 meters and should be able to be mined from an open pit. Production might begin as early as 1982 with an expected initial output of 700 tons and an annual production capacity of some 1500 tons.

SMTT will probably be jointly owned and operated by ONAREM and COGEMA, each having 50 percent equity participation. As it is currently planned, Niger will be a full partner in the legal sense of the term, and responsible for financing and for marketing half of the uranium produced. There is some possibility that the Islamic Development Bank will become a partner in this mine with a 20 percent equity share. If that were the case, ONAREM's and COGEMA's share would be reduced to 40 percent respectively.

4. TGT (Teguida n'Tessoum)

Uranium deposits in the Teguida n"Tessoum region were first discovered in 1959 by the CEA, and it was on the basis of this initial discovery that the whole uranium industry in Niger was developed. Due to the carbonized nature of the ore which made it difficult to process,

and the relatively small volume which seemed to make its profitability marginal, CEA abandoned this deposit.

The mining concession covering the Azelik deposit as well as a surrounding area of 10,000 square km was transferred to the Japan Petroleum Trading Company. A partnership was established in 1975 between JPTC and ONAREM (each holding a 50 percent share) to conduct exploratory studies of the region. In 1977, JPTC joined with Arabian Oil Company to become International Resources SA (IRSA). It is estimated that the Azelik deposit contains 7000 tons or more of uranium metal and has an annual production capacity of 1500 tons. Feasibility studies have been completed and production could start by 1983. The mining company will bring together ONAREM (50 percent), IRSA (20 percent) and Saudi Arabia and Oil (30 percent).

5. Immouraren

The Immouraren deposit, located 100 km south of Arlit is the largest known deposit in Niger with reserves estimated at 70,000 tons of uranium metal. Initial exploration revealed a relatively low grade ore. In 1974, a partnership was formed between ONAREM (30 percent), COGEMA (35 percent) and CONOCO (35 percent).

The first feasibility study of the Immouraren deposit has been completed and a second one, requested by CONOCO, in order to better determine the mine's profitability, should be completed the middle of next year. COGEMA and CONOCO have both contributed some CFAF 3 billion for investment purposes. The ore located at a depth of 120 meters will be exploited through open pit mining. Initial output is expected by 1984/1985 with an estimated 2500 ton annual production capacity.

VII. Other Planned Mining

- Djado

Located in the extreme northeast of the country, the uranium deposits in the Djado region were first discovered in 1970 by the CEA. In 1974, the Societe des Mines de Djado (SMD) was established in order to explore the 100,000 square km area. Partners in the SMD are ONAREM, COGEMA, Urangesellschaft and PNC, each holding a 25 percent share.

- Afasto-Ouest

Substantial traces of uranium were discovered in the 1,860 square area to the west of the Arlit and Akouta mines. A partnership was formed in 1975 between ONAREM, COGEMA and OURD to explore the deposit. Extensive exploratory work has recently revealed concrete indications of uranium deposits to the west of the Arlit fault. More intensive

studies will be undertaken during the next few years to determine the exact nature, quantity and location of the ore. The three partners with equal equity participation will form a formal mining company when the feasibility study has determined the profitability of the deposit.

- Afasto-Est

The Afasto-Est or Techili project lies immediately to the east of the Arlit concession. It contains known deposits of some 6,500 tons discovered by the CEA at Madaouda in the late 1960s. A partnership was formed to determine the possibilities of exploration and exploitation of the ore which has similar characteristics to that found in Azelik region. The partners in this venture are ONAREM (30 percent); Nigeria (16 percent); Central Electricity Generating Board (12 percent); Interplan (12 percent).

- In Adrar

The In Adrar permit area forms part of 10,000 square km area where the Azelik deposit is located. Exploration of the deposit is a joint venture of ONAREM (33 percent), COGEMA (26 percent), Atomic Energy Association of Iran (26 percent) and Agip Nucleaire (15 percent).

A number of research permits have been issued to Pan Ocean Oil. Esso Minerals originally had permits for several different mining areas but decided to opt out in favor of continued petroleum exploration. ARACA-OXOCO was also involved in planned mining ventures but as of this writing, has opted out of Niger.

Table 3

URANIUM PRODUCTION AND PROJECTIONS (metric tons of uranium metal)

	1977	1978	1979	1980	1981	1982	1983	1984	1986
SOMAIR	1609	1710	1800	2100	2300	2300	2300	2300	2300
COMINAK	-	350	1750	2200	2200	2200	2200	2200	2200
IMMOURAREN								1000	3000
SMTT						600	1600	1500	1500
TOTAL[a)]	1609	2060	3550	4300	4500	5100	6100	7000	9000
b)		2060	3600	4300	4500	4845	6635		

Source: a) Uranium in Niger, Delegation de la Commission des Communautés Europeénes en Republique du Niger. June 1979.

b) Ministere du Plan projections

B. THE IMPACT OF URANIUM ON THE NIGERIEN ECONOMY

The rural sector which heretofore played a crucial role as contributor to gross domestic product, earner of foreign exchange and source of government revenues, now figures less prominantly in the overall macro-economic picture. The drought sharply altered its role by curtailing agricultural output and decimating livestock herds. While recent growth trends in the rural sector have in fact contributed to overall growth, the percentage share of the rural sector in GDP, the share of agricultural exports in total exports and the portion of agricultural sector-derived revenues, has continued to decline.

In contrast, uranium has become a crucial and integral part of future economic growth and a key factor in the structural evolution of the Nigerien economy. The impact of uranium has been most marked in recent years. In 1978, the production of uranium accounted for 9.4 percent of GDP, represented 70 percent of total exports and provided the Government with revenue equal to one third of the national budget.

This section will examine the impact of uranium on the Nigerien economy between 1971 and the present and attempt to project the impact of uranium in the next decade. The primary focus will be on gross domestic product, foreign trade and payments, and public finance and investment. In addition, there will be a discussion of employment and inter-sectoral effects.

I. Gross Domestic Product

The development and expansion of uranium sector activities have been the major determinant of the structural changes in GDP that have taken place over the last six years. This trend should be accentuated well into the next decade as new mining ventures with even larger Nigerien participation, begin operations.

Prior to the 1974, the rural sector had more than a fifty percent share in GDP*. The drought-induced setback in the late 1960s and early 1970s as well as the advent of uranium sector activity resulted in a declining trend in the rural sector's contribution to GDP. In contrast, the contribution of the mining sector has been on a steady increase reaching 9.4 percent of GDP in 1978 current prices. Although output was limited in the early years of production, value added in the mining sector was a definite stabilizing factor during the drought and immediate postdrought years. Expanded production and rapid price increases after 1974 accelerated this trend. Real GDP grew by 21 and 13 percent respectively in 1976 and 1977.

*Except in 1970 and 1971

Table 4

NIGER: GROSS DOMESTIC PRODUCT 1967-1978
(current market prices)

(In billions CFAF)

	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
Rural Sector	53.7	50.9	50.0	46.4	51.9	60.7	66.0	81.8	72.5	101.0	134.4	176.7
Industry, Transport,[a] Construction, Services	11.5	11.9	13.1	19.1	20.0	25.1	32.1	28.7	36.6	47.8	70.5	97.8
Mining	0.03	0.1	0.1	0.1	1.2	1.5	1.5	2.5	9.1	14.4	21.6	35.0
Commerce	13.7	13.3	14.4	15.3	14.7	15.4	17.0	17.4	20.0	31.9	40.9	47.1
Government[b]	18.5	19.2	20.0	20.6	21.2	5.9	7.1	7.7	11.0	12.5	13.8	15.8
Total GDP	97.5	95.5	97.8	101.6	109.1	108.7	123.7	138.1	149.2	207.6	281.2	372.2
Annual % change		-2.0	2.4	3.8	7.3	-0.3	13.8	11.6	8.0	39.1	35.4	32.4

Source: IMF Staff estimates

Notes: a) 1967-1971 - does not include services

b) 1967-1971 - includes services

In addition to a greater contribution by the mining sector itself, GDP growth was spurred on by expanded activities in mining-related sectors such as transportation, construction and services. The importance of the transportation sector in uranium production is under scored by the fact that to produce one ton of uranium requires 25 tons of inputs, mainly sulphur and petroleum products. Estimates by the IMF suggest that the rapid increase in value added in transportation during 1976 and 1977 - 14 and 23 percent respectively - was largely due to the construction of the uranium road and genral expansion in the mining sector.

Activities in the mining sector and in related sectors are likely to provide the major impetus behind GDP growth in the next decade. According to data available from the IMF, value-added* originating in mining from 1975 through 1978 amounted to an average 75 percent of the gross export value of uranium. Even if, in real terms, the unit price of uranium remains constant (CFAF 24, 300 in 1979), value-added in the mining sector will continue to be a large proportion of total GDP. The chart below shows estimated production, export value, and value added from 1979 through 1983. Assumption I, implies the continuation of the 1979 price for uranium. Assumption II, implies a 4.5 percent annual increase in the price. Value added in both cases is assumed to amount to 75 percent of gross export value.

Other determinants of GDP growth through 1983 are likely to be: high growth rates in the uranium mining-related sectors of transport, construction and services, as well as a moderate growth rate in agricultural production owing to partial recovery of groundnut production, increases in rice production and improved livestock productivity. It is clear however that value added originating in mining will represent a larger and larger share of GDP, thereby accentuating the dualistic structure of the economy. The World Bank estimates that in 1985, value added in mining will represent 25 percent of GDP against 16 percent for agriculture (excluding livestock). It will thus become increasingly important to encourage investment in non-uranium sectors in order to achieve a better balance in the economy.

II. Foreign Trade and Payments

Niger's balance of payments for the ten year period 1968-1978, is characterized by fluctuating and increasing current account deficits which have been more than offset by capital inflows, originally in the form of foreign grant aid but increasingly in the form of foreign investment related to mining sector activities.

*Value added can be calculated as a residual - adding proceeds from export sales and net foreign capital flow and substracting production cost such as imported inputs and payments for local goods and services - or from individual components such as local wages and salaries, net factor income paid abroad etc.

Table 5

NIGER: BALANCE OF PAYMENTS 1968-1978

(billions CFA francs)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
A. Goods and Services	-7.0	-7.8	-8.3	-3.0	-7.0	-9.7	-28.1	-15.5	-15.9	-21.5	-27.5
Trade Balance	-4.2	-5.9	-6.1	-2.1	-3.4	-2.7	-15.2	- 2.0	- 1.7	- 4.2	- 2.1
Exports	8.5	10.2	12.9	16.1	17.9	22.2	19.6	29.7	36.9	44.9	63.4
Imports	-12.7	-16.7	-19.9	-18.3	-21.3	-31.1	-34.7	-31.6	-38.6	-49.1	-65.5
Services (net)	- 2.8	- 1.8	- 2.1	- .8	- 3.6	- 7.0	-12.9	-13.5	-14.2	-17.3	-25.4
of which: freight and insurance	.3	.1	.2	.2	.1	- 6.0	-11.5	- 9.2			
Income	- .2	- .3	- .4	9.4	- .2	.1	3.4	3.4			
B. Unrequired transfers	5.9	6.4	8.3	7.5	8.9	15.2	24.9	13.7	11.1	9.9	8.2
Private	.02	- .2	- .02	- .09	- .7	- 2.7	- 3.4	- 3.5	- 3.7	- 3.6	- 4.5
of which: workers remittances	- .6	- .8	- .5	- .8	- 1.7	- 3.2	- 3.7	- 3.7			
Official	5.9	6.6	8.3	7.6	9.7	17.9	28.3	17.2	14.8	13.5	12.7
C. Current Account Balance	- 1.1	- 1.3	- .02	4.5	1.9	5.5	- 3.2	- 1.8	- 4.8	-11.6	-19.3
D. Non monetary capital	2.3	4.2	5.5	2.1	4.4	- .6	6.2	7.3	12.4	16.1	15.5
Direct Investment	1.9	2.6	.2	- 1.3	.5	.1	1.6	3.5			
Other private long-term	.08	.09	5.2	1.5		- .2	.3	.6	7.5	10.1	8.5
Private short-term	- .4	.1	- .7	.3	.5	- 2.5	1.4	- .5			
Official	.7	1.3	.7	1.6	3.4	1.9	2.9	3.7	4.9	6.0	7.0
E. Monetary Capital						.2	- .5	.9	.2	- 0.8	0.1
F. Errors and Omissions	- 1.3	-1.3	- 3.7	- 3.2	- 3.9	- 4.0	- 4.0	- 5.2	.1	.2	—
G. Overall Balance (A through F)	- .1	1.4	1.7	3.5	2.4	1.1	- 1.5	1.2	7.9	3.9	- 3.7

Table 6

URANIUM PRODUCTION PROJECTIONS 1979-1983

	1979	1980	1981	1982	1983
Production[a)] (metric tons)	3600	4300	4500	4845	6635
Gross Export Value I (millions CFAF)	87,480	100,620	105,300	117,733	161,230
Value Added (millions CFAF)	65,610	75,465	78,975	88,299	120,922
Gross Export Value II (millions CFAF)	87,480	109,189	119,412	134,351	192,269
Value Added (millions CFAF)	65,610	81,891	89,559	100,763	144,201
Unit Price of Uranium	24.300	25.393	26.535	27.729	28.977

Source: GON estimations and author's calculations

Notes : 1979-1981: SOMAIR and COMINAK
1982-1983: SOMAIR, COMINAK, SMTT, TGT
Assume all production of a given year exported

Current Account

Except for the years 1971 through 1973, the current account* has been indeficit due to deficits on goods and services which have increased four fold from CFAF 7.0 billion in 1972 to CFAF 27.5 billion in 1978. The current account deficit has grown accordingly reaching an estimated CFAF 19.3 billion in 1978.

Uranium has played a crucial role in the growth of exports and has served to alter the composition of exports away from agricultural products. In 1978 it is estimated that on a balance of payments basis, exports of uranium represented three fourths of total exports, with a value upwards of CFAF 47.0 billion. Despite the rapid growth of exports, the trade balance has shown a deficit averaging CFAF 2.7 billion between 1971 and 1978 (not including 1974 when emergency food imports resulted in a CFAF 15.2 billion deficit). Rising prices of imports as well as increased volumes of imports of fuel and capital goods related to the mining sector have been the primary causes of the trade deficit.

The trade deficit has not been the primary cause of the current account deficit. Rather, the deficit has been due in large part to the increasing net services deficits including expenditures on insurance and freight. Net outflows of investment income include interest payments on government borrowing and earning of foreign shareholders in mining activities. Net inflow of investment income in 1974 and 1975 reflects the net losses of foreign-owned enterprises concerned with oil exploration. The net services deficit has increased at an average annual rate of 43 percent between 1972 and 1978 reaching CFAF 25.4 billion.

The impact of uranium on unrequited transfers** can be seen in terms of the net outflow of workers remittances owing to an increase in the number of skilled expatriates working in Niger. Data for the period 1971 through 1975 show a four and one half fold increase in workers remittances reaching CFAF 3.7 billion in 1975. Official transfers have tended to decrease reflecting Niger's ability to borrow resoruces for investment rather than depending only on grant aid.

Capital Account

From 1971 to 1973, the balance on the account of nonmonetary capital*** fluctuated, showing no specific trend. Flows of private capital, short-term and long-term were not significant during theat period although th interest rate differential with Western Europe encouraged investment abroad. The main component of the capital account was government borrowing.

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*The current account includes goods and services and unrequited transfers (mainly outflows of workers' remittances and inflows of foreign grant aid).

**Includes private transfers (mainly workers' remittances) and official transfer (foreign grant aid).

***Includes direct investment and government drawings on foreign loans.

Since 1973, the net inflow on the capital account has increased sharply, reflecting on the private account, increased investment and reinvestment in the mining sector, and on the official account increased borrowing by the government. The most noteworthy change has been that inflows on the capital account (private investment and government borrowing) now exceed official grants.

Between 1974 and 1977, the inflow of nonmonetary capital grew from CFAF 6.2 billion to CFAF 16.1 billion, thus more than offsetting the deficits on the current account. Estimations for 1978 show a stagnation of official transfers and capital inflows resulting in an overall deficit of CFAF 3.7 billion, the first such deficit since 1974.

Trade

As noted above, uranium has been a key factor in changing the composition of Niger's exports and in contributing to overall growth of merchandise trade. The rapid price increases after 1974 and the expansion of production were reflected in a growing share for uranium in total exports. In 1971, uranium represented 18 percent of recorded exports and by 1976 this figure had jumped to 64 percent. Uranium has thus been able to provide the foreign exchange heretofore earned by groundnut exports. The share of groundnut cakes in total exports the only groundnut product exported - was estimated at a mere .5 percent in 1978.

The composition of imports has also been affected by expanded activities in the mining sector, although not as drastically as that of exports. Import growth has been spurred on by rising prices and increased volume of fuel imports and capital goods used by the mining industry. Between 1971 and 1978 the value of capital good imports rose from CFAF 5,355 million to CFAF 13,200 million; road transportation equipment and machinery constituted the bulk of this amount.

France remains Niger's most important trading partner, although the composition of their trade has changed substantially. Traditional imports of groundnuts have now been replaced by uranium. While small amounts of uranium have been purchased by other shareholders in the two mining companies and by a few countries to whom Niger markets a small share, the bulk of uranium exports are destined for France. Up until 1976 COGEMA had been responsible for all the marketing; currently ONAREM markets about 200 tons of uranium although planned mining operations for the 1980's should expand Niger's marketing responsibilities.

Projections of Niger's balance of payments depend heavily on price projections for uranium which tend to be very unreliable. According to tentative projections by the World Bank*, it is expected that Niger

*See Annex Table

Table 7

Value of Total Recorded Exports and Uranium Exports

	1971	1972	1973	1974	1975	1976	1977[b)]	1978[b)]
Total Exports (millions CFAF)	10,670	9,049	13,817	12,621	19,556	31,979	44,900	63,400
Uranium Exports[a)] (millions CFAF)	2,000	1,451	5,428	6,322	11,882	21,000	28,400	47,000
As % of Total Exports	18.7	16.0	39.2	50.1	60.7	65.5	63.2	74.1

Source: IMF

Notes: a) Value of uranium exports differs slightly from other charts due to variations in unit price of uranium and volume exported in different sources.
b) Preliminary estimate

will generate an overall balance of payments surplus although the level could vary significantly depending on the value of uranium exports. Even assuming that the unit price of uranium remains at the 1979 level in real terms, one can expect a narrowing tade deficit due both to increased output and exports of uranium and to modest recovery of groundnut exports. Imports of intermediate and capital goods should increase in line with uranium sector activities; imports of consumer goods are expected to grow modestly. The outflow of expenditures on net services is expected to increase giving rise to a current account deficit. Capital inflows, in the form of private investment and official loans should also increase significantly. The table below shows projected uranium production and export values assuming a 4.5 percent annual increase in the unit price of uranium.

Table 8

	1979	1980	1981	1982	1983
Production (mt)	3600	4300	4845	4845	6635
Export Value (CFAF million)	87,480	109,189	119,921	134,351	192,269

It is expected that exports of uranium will represent over 80 percent of total exports by 1985. It should be noted, however, that the beneficial impact of growing uranium exports could be diminished to the extent that foreign exchange earned by these exports flows back out in the form of increased expenditures on imports.

III. Public Finance and Investment

Current budgetary operations of the central government are recorded in the Budget General de Fontionnement and capital/investment transactions are recorded in the Fonds National d'Investissements (FNI). There is also a small annexed budget — Budget Annexe d'Exploitation du Materiel de Travaux Publics. Until 1975/76, the investment budget was funded by French budgetary aid, earmarked excise taxes on petroleum products and revenues derived from uranium as well as from some profits of the National Lottery. This procedure has since been discontinued in favor of direct transfers from the general budget. Projects directly financed by foreign aid are not included in the FNI.

The operations of the Budget Generale cover the fiscal year October 1 through September 30. The FNI receives a transfer from the Budget Generale at the beginning of each fiscal year although FNI expenditures

Table 9

(In billions CFA francs)

NIGER - Revenues and Expenditures of the Central Government
1969/70 - 1978/79

Revenues/Expenditures

	1969/70	1970/71	1971/72	1972/73	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79
Total Revenue	12.00	12.40	13.16	14.14	16.42	22.38	27.46	37.62	45.74	56.74
Current Revenue	10.92	11.44	12.11	12.86	13.35	20.16	25.61	34.39	45.40	55.30
Tax Revenue	10.19	10.45	11.24	11.97	11.61	15.64	23.07	30.32	38.80	47.05
Nontax Revenue	.72	.98	.86	.89	1.73	4.52	2.53	4.07	6.60	9.24
Other Budgetary Revenue[c)]	1.09	1.11	1.35	1.59	3.06	2.21	1.84	3.23	.34	.43
Total Expenditure	11.94	12.80	13.85	14.99	16.53	19.56	25.95	34.70	45.65	56.74
Current Expenditure	10.10	10.96	11.29	11.84	14.06	17.53	22.40	28.43	32.03	35.74
Capital Expenditure[d)]	1.84	1.84	2.56	3.15	1.99	1.87	2.58	5.91	13.62	21.00
Unallocable					.47	.15	.95	.35		

Annual Percentage Change

	1969/70	1970/71	1971/72	1972/73	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79
Total Revenue		3.3	6.1	7.4	16.1	36.2	22.6	36.9	21.5	24.0
Current Revenue		4.7	5.8	6.1	3.8	51.0	27.0	34.2	32.0	24.0
Tax Revenue		2.5	7.5	6.5	-3.0	34.7	47.5	31.4	28.0	21.2
Nontax Revenue		36.1	-12.2	3.4	94.0	161.2	-44.0	60.8	62.1	40.0
Other Budgetary Revenue		1.8	21.6	17.7	92.4	-27.7	-16.7	75.5	-89.4	26.4
Total Expenditure		7.2	8.2	8.2	10.2	18.3	32.6	33.7	31.5	24.3
Current Expenditure		8.5	3.0	4.8	18.7	24.6	27.7	26.9	12.6	11.5
Capital Expenditure		-	39.1	23.0	-36.8	-6.0	37.9	129.0	130.0	54.2

tend to extend themselves over several years. The Five Year Plan for the first time will attempt to provide a longer term perspective for the FNI by approving funds over the full five year period.

It is in the area of public finance and investment that uranium has had, and will continue to have, its most pervasive impact. The increased availability of uranium-derived resources has dramatically changed the investment capabilities of the government and has led to a rapid expansion of appropriations for the capital/investment budget. Revenue derived from uranium has substantially contributed to total revenue and has enabled the government to introduce several fiscal measures designed to ease the tax burden of low-income groups.

Since 1971, the budgetary operations of the government have been characterized by strict current expenditure control resulting in increased budgetary savings on the current account, and rapidly increasing capital expenditures due to substantial revenues derived from uranium. Captial expenditures represent an increasingly large share of total expenditure but disbursements and actual investment realization have consistently fallen below appropriations. The relatively low disbursement rate is due both to the limited absorptive capacity of the Ministries in charge of implementation and to the nature of certain projects whose execution period exceeds the budgetary year thus causing unspent appropriations. These unspent funds are carried over for three years at which time (theoretically) any remaining funds are annuled.

The 1978/79 budget continues past trends as current expenditures are only budgeted to increase by 50 percent, reflecting CFAF 21.0 billion in fiscal revenues derived from uranium. Preliminary estimates for the 1979/80 budget reveal certain changes in this regard, with current expenditures rising by almost 30 precent from the previous year.

The impact of uranium on revenues

During the period 1971/72 through 1978/79, central government revenue grew at an average annual rate of 23.5 percent from CFAF 13.16 billion to CFAF 56.74 billion. Tax revenue contributed about 80 percent to the increase with taxes on income, taxes on goods and services, and taxes on international trade contributing 23.5, 40.2 and 21.5 percent respectively. Fiscal revenues from uranium constitute the bulk of these revenues, contributing an estimated CFAF 46 billion between 1975/76 and 1978/79.

The tax structure of companies involved with research, exploitation and processing of uranium and related substances is set forth in Law 68-02 of January 1968, modified and amended in 1970 and 1975. There are several set fees for research and exploitation permits and there are different taxes applied to uranium mining at various stages of production and exportation. Profits before distribution (Benefices Industriels et Commerciaux) are taxed at 40.5 percent; dividends

Table 10

TOTAL, CURRENT AND CAPITAL EXPENDITURE
(1973/74 - 1979/80)
millions CFAF

	1973/74	1974/75	1975/76	1976/77	1977/78[a)]	1978/79[a)]	1979/80[a)]
Total Expenditure	16,534	19,562	25,953	34,702	44,504	56,742	72,145
Current Expenditure	14,065	17,538	22,406	28,432	30,404	35,742	46,145
Capital Expenditure	1,991	1,873	2,587	5,914	14,100	21,000	26,000
Capital Expenditure as % of Total	12.0	9.5	10.0	17.0	32.0	37.0	36.0

Source: IMF, Ministere des Finances

Notes : a) Budgeted amounts

distributed to foreign shareholders are taxed at 16 percent; royalties are proportional to production at 4.5 percent; and uranium concentrates are taxed at a rate of 1 percent of their export value. In addition, other uranium-related revenue is derived from ONAREM's equity participation in the mining companies and from a set fee levied on each kilogram of uranium produced. This revenue accrues to a gurantee fund (Fonds de Garantie du Niger) used for investment purposes*.

Under the present tax structure, the size of profit is the most important factor in determining government revenues derived from uranium. SOMAIR, the first mining company to begin production, did not start generating profits until its fifth year of operations, although it received substantial tax breaks. Currently profits represent betwen 41 and 47 percent of the total export value so that the BIC profit tax is quite substantial. COMINAK is expected to generate important profit beginning its second year of operations, although less than SOMAIR. The next two mines to begin production in the early 1980's are expected to generate less taxable profit.

An important aspect of increased revenue from uranium mining operations was the introduction of several fiscal measures designed to ease the tax burden of low-income groups. The livestock tax was abolished in 1974 following the drought and the head tax (impot minimum fiscal) levied on farmers and cattle raisers was eliminated in two steps in 1976 and 1977. Beginning in 1977/78, income taxes on monthly salaries below CFAF 15,000 (approximately $70.00) were eliminated. The World Bank estimates that for 1977/78 the foregone revenues from these sources represent less than one quarter of uranium revenue for that year.

The impact of uranium on expenditure

Most central government investment expenditure is carried out through the National Investment Fund (FNI). Until 1974/75, some capital expenditure was channeled through Title IV in the current budget and through the annexed budget. Currently there is a special extra-budgetary account whose revenue is derived from a special fee levied on uranium production.

While growth in current expenditure has been kept well below revenue growth, annual growth of capital appropriations has been considerable due to the increased availability of uranium-derived revenues.** Uranium has thus had a crucial impact upon the level of investment activity in Niger although the absorptive capacity of the public sector has not been able to keep pace with the amount of funds

*See Note in Annex

**While annual increases in FNI appropriations are clearly dependent upon the availability of uranium revenues, GON officials have emphasized that there is not a direct linkage. Recent statements concerning the 1979/80 budget have, however, equated the two: revenue from uranium is estimated at CFAF 26.0 billion, as is FNI expenditure.

available, resulting in sizeable unspent appropriations each year (i.e., money in the pipeline).

Table 11

Growth of Budgeted Capital Expenditure
(CFAF billion)

Year	71/72	72/73	73/74	74/75	75/76	76/77	77/78	78/79	79/80
CFAF Billion	2.17	2.70	3.20	2.50	6.70	10.70	14.00	21.00	26.00
Annual growth rate		24.0	18.5	-22.0	168.0	59.7	30.8	50.0	24.0

Current budgetary practice allows unspent appropriations to be carried over for a three year period, and as such, Ministries often submit requests without due regard to their ability to effectively absorb these funds. Bottlenecks also occur during the phase of project implementation due to cumbersome bureaucratic procedures.

According to the World Bank, the rate of actual spending was approximately 60 percent of the budgeted amount between 1972/73 and 1976/77* as illustrated below.

Table 12

(Billions CFAF)

	1972/73	1973/74	1974/75	1975/76	1976/77
Budgeted Capital Expenditure	2.70	3.20	2.50	6.70	10.70
Actual Capital Expenditures	1.71	2.00	1.87	2.59	5.91
Ratio of Actual to Budgeted %	63	63	75	39	55

*The calculations of the World Bank are based on year by year appropriations and expenditures. Since FNI spending takes place on a rolling basis these ratios may be somewhat misleading. See Annex Table for an example of carry-over prodedure.

At the present, excess cash is deposited with the banking system* and it is expected that this practice will continue due to revenues from uranium growing at a faster rate than the absorptive capacity of the public sector.

Investment activities undertaken by the FNI constitute the primary indirect effect of uranium and as such have the potential to transform revenues from a non-renewable resource into renewable, productive activities which could generate self-sustaining economic growth. As noted in the recent World Bank report, domestic resources are more fungible than foreign aid and could allow the government greater flexibility as well as greater long term planning stability. While activities in the mining sector per se have a limited direct impact on the rural populace, investment activities of the FNI could have a much broader-based effect. At present, much emphasis is being placed on education. In 1975/76 and 1976/77, education received 18.3 and 29.3 percent respectively of investment expenditure.

Another area which has received a larger share of total investment expenditure is that of counterparts of foreign financed projects. In the 1977/78 budget, it was estimated that these local investment costs amounted to CFAF 2.2 billion or 15 percent of the total.

Although increased uranium-derived revenue could lead to some government expenditure on recurrent costs of donor-financed projects** , the primary obstacle in the near and medium term will be above all human and not financial. The operation and maintenance of projects requires funding, but it also requires well qualified, trained personnel. This is an important aspect of any recurrent cost examination.

Future Prospects

Given the expanded activities in the uranium sector planned over the next five to ten years and given CNAREM's increased equity participation, even if less taxable profits are generated from the upcoming mines, the revenues accruing to Niger will continue to be substantial. It is most likely that the revenues will represent too

*There are four commercial banks: Banque Internationale pour l'Afrique Occidentale (BIAO), Banque de Developpement de la Republique du Niger (BDRN), CREDIT du Niger (CN) and Caisse Nationale de Credit Agricole (CNCA). About two thirds of government deposits go to these commerical banks, enabling the latter to meet demand for credit from the private sector.

**According to Gon Budget officials, recurrent costs are now being financed out of the current budget although no breakdowns are available.

large a sum to be effectively channeled into public investment.* Alternative solutions might involve the transfer of some public revenues to local private investment or to financial assets. The consideration of the appropriate rate of investment in line with the country's absorptive capacity should be of utmost importance.

The amount of revenues that will accrue to the government over the next five to ten years is linked both to the unit price of uranium, to the profit margin and to the tax structure. Projections of this nature are usually hazardous due to the number of variables involved. The World Bank has made projections using a low, medium and high price assumption and assuming a 25 percent ratio of government revenue to gross export value. The current ratio for SOMAIR is around 35 to 38 percent, and although the new mines are expected to generate less taxable profit, it is not at all clear whether the ratio will in fact drop as low as 25 percent. In addition, the recent creation of the Fonds de Garantie du Niger** which draws its revenue from a set fee levied on each kilogram of uranium produced, should result in a sizeable contribution to total uranium-derived receipts.

Preliminary documents concerning the mining sector in the 1979-1983 Development Plan project a 4.5 percent yearly increase in the per unit price of uranium. Although the reliability of such a fixed percentage increase is questionable, it can serve to give a rough estimation of potentially available revenues. The chart below gives estimations for production, gross export value and revenue, assuming a 4.5 percent annual increase in the per unit price of uranium and a 25 percent ratio of Government revenue to gross export value.

Thus even at the relatively low revenue ratio, in 1983 Niger would have some CFAF 48.0 billion potentially available for investment pruposes. At the current rate of exchange ($1 = 212 CFAF), this would amount to $226 million. At a 35 percent ratio of government revenue to gross export value, this would increase to over $315 million.

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*The 1978/79 FNI budget for example, includes the CFAF 21.0 billion originally appropriated, as well as CFAF 6.0 billion accumulated from previous unspent appropriation. Results through August 1979 show approximately CFAF 12.0 billion realized investment and some CFAF 7.0 billion in commitments. The remainder excluding in theory unspent funds from 1975/76, will be carried over into the 1979/80 budget which is tentatively set at CFAF 26.0 billion

**The Guarantee Fund is extra-budgetary. See Note in Annex.

Table 13

	1979	1980	1981	1982	1983
Production (mt)	3600	4300	4500	4845	6635
Gross Export Value (million CFAF)	87,480	109,189	119,412	134,351	192,269
Revenue* (millions CFAF)	21,870	27,297	29,853	33,587	48,067

IV. Linkage Effects with other Sector of the Economy

The uranium mining industry exhibits many of the characteristics of an enclave type activity in that most of the inputs are imported and much of the net profit is transferred abroad together with the earnings of expatriate personnel. In the 1976 World Bank Report**this point was underscored: ". . .uranium mining in Niger is largely an enclave type industry with a very limited employment effect and few direct input/output linkages with the rest of the economy except in the transport sector." Further the report states: "While it is evident that uranium production is making a positive and growing contribution to Niger's economy, there is no reason to expect that it is going to be the miracle sector that will change completely the country's development outlook". While uranium is not in itself a definitive solution to the country's problems, it has in fact become a catalyst for change and a crucial aspect of this phase of economic growth.***

*The revenue ratio is more likely than not underestimated. In any case i is not meant to include dividends or the per unit-produced fee mentioned

**Economic Memorandum Niger, World Bank May 13, 1976, pg. 26 and pg.ii.

***As Eliot Berg notes in Recent Economic Evolution of The Sahel (June 197 "With respect to 'enclaves', the Sahel experience puts their role and potential in greater perspective. It illustrates the absurdity of the kind of blanket condemnation given to enclaves nowadays. It would be foolish or worse to believe that mining firms or other enclave-type activities will by themselves transform or modernize poor countri But it is at least as foolish and may even be more wicked to ignore or minimize their contribution to budget and balance of payments stability and growth". (p.142)

Uranium has had important direct and indirect effects on the economy. The direct effects are those associated with the construction, transprotation and services sector while the indirect effects are those related to the availability of uranium-derived resources for investment purposes. The direct linkage effects of uranium mining with other sectors of the economy will be the subject of this section.

1. Transportation, Construction, Services

Since 1972, value-added in the transport, contruction and services sector has increased from CFAF 16.2 billion to CFAF 83.6 billion in 1978 — an average annual increase of 50 percent — and had contributed over 25 percent to the total increase in GDP for the same period. Much of the surge of activity in this sector is directly attributable to expanded mining sector activities.

One of the major uranium-related projects is the construction of the "uranium road"*which is to extend 656 km between Tahoua and Arlit. Construction is now underway and is expected to be completed within three years. The total cost of the project is estimated at CFAF 42 billion, to be financed by the mining compies operating within the CONCERTA (Societe Concessionnaire de la Route Tahoua-Arlit). The financial holding has an initial capital of CFAF 239 million shared by SOMAIR (30.5 percent), COMINAK (30.5 percent), COGEMA (11.3 percent) and nine other mining companies expected to come on stream after 1982 (27.7 percent). The road will have an important beneficial impact upon the reliability of deliveries, on cost savings for maintenance as well as on commerce and the development of public services.

Also in the area of construction, the development of mining towns have already had an important regional economic impact. The towns of Arlit and Akokan have a combined population of some 15,000 inhabitants, including mining workers, their families and people involved in ancillary activities. The continued expansion of mining sector activities will lead to increases in the number of inhabitants in these towns as well as to the development of other towns in mining areas. The towns have

*A protocol agreement was signed by all the parties involved. Initially, the three American (and Candadian) companies- ESSO MINERALS, CONOCO and Pan Ocean refused to sign the agreement unless it contained specific language terminating their obligation to finance and maintain the road if the decision was made to withdraw. ESSO is now out of the picture. Both CONOCO and Pan Ocean have agreed in principal to the arrangement although the amount and timing of their financial commitment is yet to be determined.

become markets for local products and have accelerated the development of public services. An additional linkage effect has been the establishment of training centers for the mining workers and of a national mining school "Ecole des Mines d'Air."

Based on coal deposits of some 5 million tons, the Societe du Nigerienne Charbon (SONICHAR) has begun construction on a coal mine and generating station which will produce electricity for the mining companies in the Arlit-Agadez region. SONICHAR will be responsible for production while the Societe Nigerienne d'Electricite (NIGELEC) will be responsible for transportation and distribution. The project will have an estimated production capacity of 275 million KWH and is expected to save a considerable amount of foreign exchange through reduced imports of petroleum. Total investment costs amount to CFAF 41 billion with initial capital divided among Niger (26.4 percent), SOMAIR and COMINAK (47 percent), Banque du Developpement de la Republique du Niger (10.5 percent) SONARA (10.5 percent), NIGELEC (2.6 percent) and Societe Nationale des Transports Nigeriens (2.6 percent).

2. Employment

Although the number of jobs generated by the mining sector—some 2,000 in 1979—is not that impressive, it already represents 10 percent of wage and salary earners in the private and parastatal sector. Expanded activities in the mining sector are expected to result in an increase in the number of jobs to 7,000 by 1985. Additionally, employment in the related areas of construction, transportation and services, is likely to increase rapidly.

Given these trends, it can be expected that the mining sector will be a major employer of Niger's non-agricultural labor force and will have a marked impact upon the wage structure in other sectors. Uranium mining jobs have been paying a premium in order to compete with other jobs in less remote, more attractive urban areas and while this may tend to raise wages throughout the economy, it could also serve to distort production costs in the modern as well as in the rural sector.

The growing need for trained and skilled personnel has necessitated the setting up of on site training programs. Both SOMAIR and COMINAK are involved in these programs and have contributed to the financing of a national mining school "Ecole des Mines de l'Air, which hopes to produce 40 to 50 graduates per year.

Annex

1. General Note on Statistical Data

2. General Note on Projections

3. Uranium Research and Exploration

4. Companies Involved in Research and Exploration

5. Notes on FED Report

6. Notes on "Fonds de Garantie du Niger"

7. Note on World Bank Projections

8. Total Revenue, Tax Revenue and Revenue From Uranium

9. Government Budget Revenue

10. Gross Domestic Production - Current Prices

11. Gross Domestic Product (in percent)

12. Composition of Recorded Exports

13. Composition of Recorded Exports

14. Uranium Production and Projections

15. Niger-Mining permit map

General Note on Statistical Data

Economic data is relatively weak and irregular and should be treated with caution. Many variations exist depending on the source. For the purposes of consistency, most of the data in this report is based on findings, estimates and projections of the IMF. Uranium - related statistics in particular seem to be subject to considerable variations. Production and price figures are primarily based on GON data although when included in general economic tables, the IMF figures have been used.

General Note on Projections

The unreliability of economic projections is accentuated by their dependence on price and production projections for uranium. Nontheless, an attempt has been made to give some overall projections for GDP , foreign trade and payments, and public finance in order to get a rough idea of Niger's economic situation through 1985.

While some of the discussion relies on World Bank estimates and projections, we have chosen not to use their figures. Instead we have based the general macro-economic projections on GON production estimates and price estimates which assume a 4.5 percent annual increase in the price of uranium, and on IMF estimates for 1978. It should be emphasized that these projections are only meant to be illustrative.

URANIUM RESEARCH AND EXPLORATION
(in percent)

Mining Company/ Partnership	Niger (a)	France	U.S.	Japan	Great Britain	Italy (h)	Spain (i)	Canada (j)	Iran (k)	Saudi Arabia (e)	Nigeria (m)	Germany (FRG)
SOMAIR	33	53.9 (b)				6.5						6.5 (n)
COMINAK	31	34 (b*)		25 (d)			10					
Tassa N'Taghalgue (SMTT)	50	50 (b*)										
Teguida N'Tessoum (TGT)	50 50			50 20(e)						30		
Immouraren	30	35 (b*)	35 (c)									
Djado (SMD)	25	25 (b*)		25 (f)								25 (n)
Afasto-Ouest	33.3	33.3 (b*)		33.3 (d)								
Afasto-Est	30	30 (b*)			12						16	12 (o)
In-Adrar	33	26 (b*)				15			26			
Amachech, Ourarene, Tazole, Agades	49											
Tikiritene Assamako Emi-Lulu	50							50				

(a) Office Nationale des Recherches Minieres du Niger - ONAREM

(b) Compagnie Generale des Matieres Nucleaires - COGEMA (26.9%)
Compagnie Francaise des Minerais d'Uranium - CFMU (11.7%)
Pechiney-Mokta (7.5%)
Minatome (7.5%)

(b*) COGEMA

(c) Continental Oil Corporation - CONOCO

(d) Overseas Uranium Resources Development Company - OURD

(e) International Resources SA -IRSA

(f) Power Nuclear Corporation

(g) Central Electric Generating Board - CEGB

(h) Agip Nucleaire

(i) Empresa Nacional del Uranio S.A. - ENUSA

(j) Pan Ocean Oil Ltd.

(k) Organization for Atomic Energy Iran - OAEI

(l) Saudi Arabia and Oie

(m) Nigeria Mining Corporation - NMC

(n) Urangesellschaft

(o) Interplan

Companies Involved in Research and Exploitation of Uranium - by country

FRANCE

Compagnie Generale des Matieres Nucleaires - COGEMA
Compagnie Francaise des Mines d'Uranium - CFMU
Pechiney - Mokta
Minatome

USA

Continental Oil Company - CONOCO
ARACCA - OXOCO

JAPAN

Overseas Uranium Resources Development Company - OURD
Power Nuclear Fuel Development Corporation - PNC
International Resources S.A. - IRSA

FEDERAL REPUBLIC OF GERMANY

Urangesellschaft
Interplan

GREAT BRITAIN

Central Electric Generating Board - CEGB

ITALY

Agip Nucleaire

SPAIN

Empresa Nacional del Uranio S.A. - ENUSA

CANADA

Pan Ocean Oil Ltd.

IRAN

Organization de l'Energie Atomique - OEA

NIGERIA

State of Nigeria

Notes on FED Report: L'Uranium au Niger

This report, done under the aegis of the European Community Delegation in Niger, was written by a FED economist Ekkehart Gableman in March 1978. A slightly revised and updated version was released in June 1979 although the information does not seem to be as current as that which I have gotton through contacts at the Ministry of Plan and conversations with representatives of uranium-related companies.

The main discrepancies relate to the timing of new mining operations specifically, Immouraren which the FED study projects will begin production in 1984 with an output of 1000 tons, and SMTT, projected to begin operations in 1982 with a 600 ton output. More recent information would seem to indicate that new mines would begin a year or so later than the FED study projected. In addition, the FED study does not include the Teguida N'Tessoum mine in its projections. This mine should begin operations in 1982/83. Other items of interest that are not mentioned in the FED study are obviously those concerning the most recent developments of mining-related companies. These would include Esso's and ARACCA-OXOCO's departure, as well as CONOCO's plans for Immouraren etc.

Two interesting items brought out in the updated FED report are the association of the Japan Petroleum Trading Company (JPTC) with the Arabian Oil Company in 1977, to form International Resources

S.A. Japan (IRSA), and the potential participation of the Islamic Development Bank (20 percent), in the SMTT, scheduled to begin operations in 1982. Both of these items should be followed up on.

The chart on page 11, gives production projections of the FED compared with projections of the Ministere du Plan.

NOTES ON "FONDS DE GARANTIE DU NIGER"

According to confidential French source, an additional source of Government revenue accrues to an extra-budgetary Guarantee Fund set up by President Kountche in 1978. A fee is levied on each kilogram of uranium produced by the mining companies. In 1978, the fee was CFAF 666/kg. and in 1979 this was raised to CFAF 2000/kg. It is not known whether this practice will continue or whether the fee will increase each year. It is known that in 1978, the CFAF 1.6 billion accrued was used in part to buy the Fokker F 27-600 for Air Niger.
The breakdown for1978 and 1979 is as follows:

	SOMAIR		COMINAK	
	'78	'79	'78	'79
Production (metric tons)	1800	1800	600	1500
Fonds de Garantie (CFAF millions)	1,200	3,600	400	3,300

If one uses the GON production projections through 1983 and the current fee of CFAF 2000/kg., the funds available to the Fonds de Garantie would be as follows:

	1980	1981	1982	1983
Production (metric tons)	4300	4500	4845	6635
Fonds de Garantie (CFAF millions)	8,600	9,000	9,690	13,270

NOTE ON WORLD BANK PROJECTIONS

In its most recent Country Economic Memorandum on Niger (draft only), the World Bank staff has made a series of tentative projections concerning uranium production and prices through 1990. Uranium production is assumed to reach 6,400 tons by 1985 and 9,400 tons by 1990. Three assumptions for export prices are used with a projected overall inflation rate of 7 percent per year.

- low assumption: 3.5 percent decline per year in 1978 constant prices or a 3.5 percent increase in current prices.
- medium assumption: no change in constant prices or a 7 percent per year increase in current prices
- high assumption: a 2 percent increase per year in 1978 constant prices or a 9 percent per year increase in current prices.

Production projections differ substantially from GON estimates. Prepatory materials on the mining sector (or the Five Year Plan suggest a 4.5 percent annual increase in the per unit price of uranium.

Total Revenue, Tax Revenue, and Revenue from Uranium

	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79
Total Revenue (millions CFAF)	16,420	22,385	27.460	37,627	44,504	56,742
Tax Revenue (millions CFAF)	11,615	15,647	23,075	30,324	28,558	47,058
As % of Total	70.7	69.9	84.0	80.6	64.2	82.9
Uranium Revenue (millions CFAF)	1,009	3,478	7,579	10,565	14,579	21,650

Source: IMF and Ministere des Finances

GOVERNMENT BUDGET REVENUE 1969/70-1978/79 (In millions CFAF and %)

	1969/70		1970/71		1971/72		1972/73	
	CFAFM.	%	CFAFM.	%	CFAFM	%	CFAFM	%
TAX REVENUE	10,190	84.8	10,455	84.3	11,245	85.4	11,976	84.6
Taxes on income and profits	1,238	10.3	1,354	10.9	1,486	11.2	1,884	13.3
of which: industrial, commercial noncommercial, agricultural-	(435)	(3.6)	(620)	5.0	(524)	4.0	(792)	5.5
Employers' payroll taxes	21	.1	24	.1	14	-	26	-
Property taxes	782	6.5	718	5.8	653	5.0	301	2.1
Taxes on goods and services	3,833	32.0	4,225	34.1	4,494	34.1	5,065	35.9
of which:								
turnover taxes	(2,741)	(22.8)	(3,074)	(24.8)	(3,311)	(25.1)	(3,743)	(26.4)
excise taxes	(1,005)	(8.3)	(1,061)	(8.5)	(1,087)	(8.2)	(1,202)	(8.4)
taxes on uses of goods and property	(66)	(.5)	(62)	(.5)	(65)	(.5)	(86)	(.6)
Taxes on international trade	2,244	18.6	2,155	17.3	2,370	18.0	2,543	18.0
Import taxes & duties	(1,593)	(13.2)	(1,632)	13.1	(1,555)	11.8	(1,688)	12.0
Export taxes & duties	(598)	(5.0)	(473)	3.8	(769)	5.8	(804)	5.6
Other taxes	2,070	17.2	1,977	16.0	2,227	17.0	2,156	15.2
of which: head tax a)	(1,825)	(15.1)	(1,718)	13.8	(1,850)	14.0	(1,684)	
NON-TAX REVENUE	720	6.0	989	8.0	865	6.5	890	11.0
OTHER REVENUE b)	1,097	9.1	1,116	9.0	1,356	10.3	1,783	12.6
TOTAL REVENUE	12,008	100.0	12,389	100.0	13,161	100.0	14,148	100.0
Annual Percentage Growth			3.1		6.2		7.5	

1973/74		1974/75		1975/76		1976/77		1977/78 c)		1978/79 c)	
CFAFM.	%	CFAFM.	%	CFAFM.	%	CFAFM.	%	CFAFM.	%	CFAFM.	%
11,615	70.7	15,647	70.0	23,075	84.0	30,324	80.5	34,263	89.7	47,058	83.0
3,418	20.8	5,159	23.0	8,033	29.2	10,338	34.0	12,287	32.1	17,935	31.6
(901)	(5.5)	(1,730)	(7.7)	(4,039)	(14.7)	(6,273)	(16.6)	(9,487)	(24.8)	(14,535)	(25.6)
38	.2	27	.1	48	.1	49	.1	75	.2	60	.1
64	.4	75	.3	131	.5	160	.4	199	.5	224	.4
5,644	34.3	6,665	29.7	8,686	31.6	11,587	30.8	11,822	31.0	15,327	27.0
(4,069)	(24.8)	(4,989)	(22.2)	(6,415)	(23.3)	(8,622)	(23.0)	(9,025)	(23.6)	(12,740)	(22.4)
(1,111)	(6.7)	(1,172)	(5.2)	(1,445)	(5.2)	(1,607)	(4.2)	(1,700)	(4.4)	(1,350)	(2.3)
(347)	(2.1)	(452)	(2.0)	(723)	(2.6)	(1,209)	(3.2)	(155)	(.4)	(1,082)	(1.9)
2,370	14.4	3,634	16.2	5,351	19.4	6,438	17.1	8,150	21.3	9,486	16.7
(1,810)	(11.0)	(2,528)	(11.3)	(4,070)	(14.8)	(4,780)	(12.7)	(6,005)	(15.7)	(6,835)	(12.0)
(560)	(3.4)	(1,105)	(5.0)	(1,281)	(4.7)	(1,658)	(4.4)	(2,145)	(5.6)	(2,651)	(4.6)
78	.5	84	.3	143	.5	237	.6	180	.5	180	.3
1,737	10.5	4,521	20.1	2,536	9.2	4,071	10.8	3,350	8.7	3,743	6.5
3,068	18.7	2,216	10.0	1,848	6.7	3,231	8.5	583	1.5	434	.7
16,420	100.0	22,385	100.0	27,460	100.0	37,627	100.0	38,196	100.0	56,742	100.0
16.0		36.3		22.6		37.0		1.5		48.5	

NIGER: GROSS DOMESTIC PRODUCT - CURRENT MARKET PRICES 1967-1978

(in billions CFA francs)

GDP Current

	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
Rural Sector	53.7	50.9	50.0	46.4	51.9	60.7	66.0	81.8	72.5	101.0	124.4	176.7
Agriculture, forestry, fishing						39.7	51.1	66.2	54.0	76.8	103.1	137.1
Subsistence crops						30.4	46.8	59.4	46.2	66.6	91.4	121.9
Cereals						(26.5)	(35.4)	(51.9)	(39.4)	59.4	83.5	109.1
Other						(3.9)	(11.4)	(7.5)	(6.8)	7.2	7.9	12.8
Cash crops						9.3	4.3	6.8	7.8	10.2	11.7	15.2
Groundnuts (unshelled)						(6.0)	(1.9)	(3.3)	(1.4)	2.6	3.2	3.4
Cotton (unginned)						(0.1)	(0.1)	(0.1)	(0.2)	0.1	0.1	0.2
Cowpeas						(2.7)	(1.9)	(2.8)	(5.1)	6.1	7.9	9.7
Other						(0.5)	(0.4)	(0.6)	(1.1)	1.4	1.4	1.9
Livestock						21.0	14.9	15.6	18.5	24.2	31.3	33.6
Cattle						(10.9)	(6.4)	(6.8)	(8.1)	10.5	13.3	16.3
Sheep and goats						(2.7)	(2.3)	(2.4)	(2.8)	3.7	4.9	6.1
Other						(7.4)	(6.2)	(6.4)	(7.6)	10.0	13.1	17.2
Industry, transport, construction and services	11.5	11.9	13.1	19.1	20.0	25.1	32.1	28.7	36.6	47.8	70.5	97.8
Agricultural processing						8.9	11.4	4.9	8.3	9.0	12.7	14.2
Groundnuts						(7.2)	(8.0)	(2.5)	(4.6)	1.8	4.0	4.9
Cotton						(0.2)	(0.1)	(0.1)	(0.2)	0.3	0.4	0.2
Cowpeas						(1.5)	(3.3)	(2.3)	(3.5)	6.9	8.3	9.1
Energy						0.5	0.7	0.9	1.0	1.3	2.0	2.8
Other						15.7	20.0	22.9	27.3	37.5	55.8	80.8

	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
Mining	0.03	0.1	0.1	0.1	1.2	1.5	1.5	2.5	9.1	14.4	21.6	35.0
Commerce	13.7	13.3	14.4	15.3	14.7	15.4	17.0	17.4	20.0	31.9	40.9	47.1
Government	18.5	19.2	20.0	20.6	21.2	5.9	7.1	7.7	11.0	12.5	13.8	15.8
TOTAL GDP	97.5	95.5	97.8	101.6	109.1	108.7	123.7	138.1	149.2	207.6	281.2	472.2
Annual Change (%)		-2.0	2.4	3.8	7.3	-0.3	13.8	11.6	8.0	39.1	35.4	32.4

Notes

Breakdown not available 1967-1971

For 1967 - 1971, figure does not include services

For 1967 -1971, figure also includes services

NIGER: GROSS DOMESTIC PRODUCT - CURRENT MARKET PRICES 1967-1978

(In percent)

	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
Rural Sector	55.1	53.3	51.3	45.6	47.6	55.8	53.3	59.2	48.5	48.6	47.7	47.4
Industry, transport construction services	11.7	9.7	13.3	18.7	18.3	23.0	25.9	20.7	24.5	23.0	25.0	26.2
Mining	-	0.1	0.1	0.1	1.1	1.3	1.2	1.8	6.0	6.9	7.6	9.4
Commerce	14.1	13.9	14.7	15.1	13.5	14.1	13.7	12.5	13.4	15.3	14.5	12.6
Government	19.1	20.1	20.5	20.3	19.5	5.4	5.7	5.5	7.3	6.0	4.9	4.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(In percent)

GROSS DOMESTIC PRODUCT - CONSTANT PRICES (1972) 1972-1978

	1972	1973	1974	1975	1976	1977	1978
Rural Sector	55.8	43.6	50.0	44.4	46.8	45.7	43.7
Industry, transport, construction services	23.0	31.2	25.6	29.6	26.5	28.8	31.4
Mining	1.3	1.7	2.0	2.3	2.0	2.0	2.7
Commerce	14.1	16.5	15.4	16.1	17.7	16.7	15.1
Government	5.4	6.7	6.7	7.4	6.7	6.6	6.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

NIGER: COMPOSITION OF RECORDED EXPORTS 1968-1978

(in millions of CFA francs)

	1968	1969	1970	1971	1972[a]	1973	1974	1975	1976[b]	1977[c]	1978[c]
Uranium concentrate	-	-	-	2,000	1,451	5,428	6,322	11,882	20,476	28,400	47,000
Livestock	863	890	1,390	1,445	585	2,313	2,093	3,653	4,798	8,070	11,600
of which: cattle	(779)	(771)	(1,232)	(1,703)	(471)	(1,873)	(1,564)	(2,146)	(4,519)	(5,665)	(7,300)
Meat						133	124	283	210		
Hides and skins						662	607	177	477		
Groundnuts (shelled)	4,513	3,721	4,934	3,413	3,784	1,844	--	2	697		
Groundnuts oil	330	191	566	967	224	1,416	1,145	1,026	919		
Groundnuts cake	78	63	192	265	152	335	135	184	369	320	330
Cotton	393	297	160	561	121	94	16	46	400	400	100
Vegetables	431	672	644	284	35	139	152	575	2,785		
of which: onions	(46)	(126)	(326)	(193)	(8)	(112)	(129)	(430)	(222)		
cowpeas						(1)	(8)	(137)	(2,537)	(3,100)	(210)
Other	530	799	690	877	2,508	1,453	1,977	1,728	848		
Total f.o.b.	7,241	6,402	8,795	10,670	9,049	13,817	12,621	19,556	31,979	44,900[d]	63,400[d]
	(in percent of total)										
Uranium concentrate	-	-	-	18.7	16.0	39.2	50.0	60.7	64.0	63.2	74.1
Livestock	12.0	13.9	15.8	18.1	6.5	16.7	16.5	18.6	15.0	18.0	18.2
of which: cattle	(10.8)	(12.0)	(14.0)	(15.9)	(5.2)	(13.5)	(12.3)	(10.9)	(14.1)	(12.6)	(11.5)
Meat						.9	1.0	1.4	.6		
Hides and skins	1.2	2.7	2.2	3.1	1.3	4.7	4.8	.9	1.5		
Groundnuts (shelled)	62.3	58.1	56.1	32.0	41.8	13.3	-	-	2.1		
Groundnuts oil	4.6	3.0	6.4	9.1	2.5	10.2	9.0	5.2	2.8		
Groundnuts cake	1.1	1.0	2.2	2.5	1.7	2.4	1.4	.9	1.1	.7	.5
Cotton	5.4	4.6	1.8	5.3	2.0	6.7	.1	.2	.1	.9	.1
Vegetables	5.9	3.8	7.3	2.7	.4	1.0	1.2	2.9	8.7		
of which: onions	(.6)	(2.0)	(3.7)	(1.8)	(.1)	(.8)	(1.0)	(2.1)	(.7)		
cowpeas						(-)	(-)	(.7)	(7.9)	(6.9)	(.3)
Other	7.3	12.5	7.8	8.2	27.7	10.5	15.6	8.8	2.6		
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Exports - Annual Percentage change										
		-11.6	37.3	21.3	-15.1	52.6	-8.6	55.0	63.5	40.4	41.2

Evolution of per unit price of uranium

	(in CFAF/kg)	annual % increase
1971	4.918	
1972	4.918	
1973	4.597	- 6.5
1974	5.117	11.3
1975	10.000	95.4
1976	14.000	40.0
1977	20.000	43.0
1978	23.500	17.5
1979	24.300	3.4

URANIUM PRODUCTION AND PROJECTIONS 1979-1983
EXPORTS & REVENUES

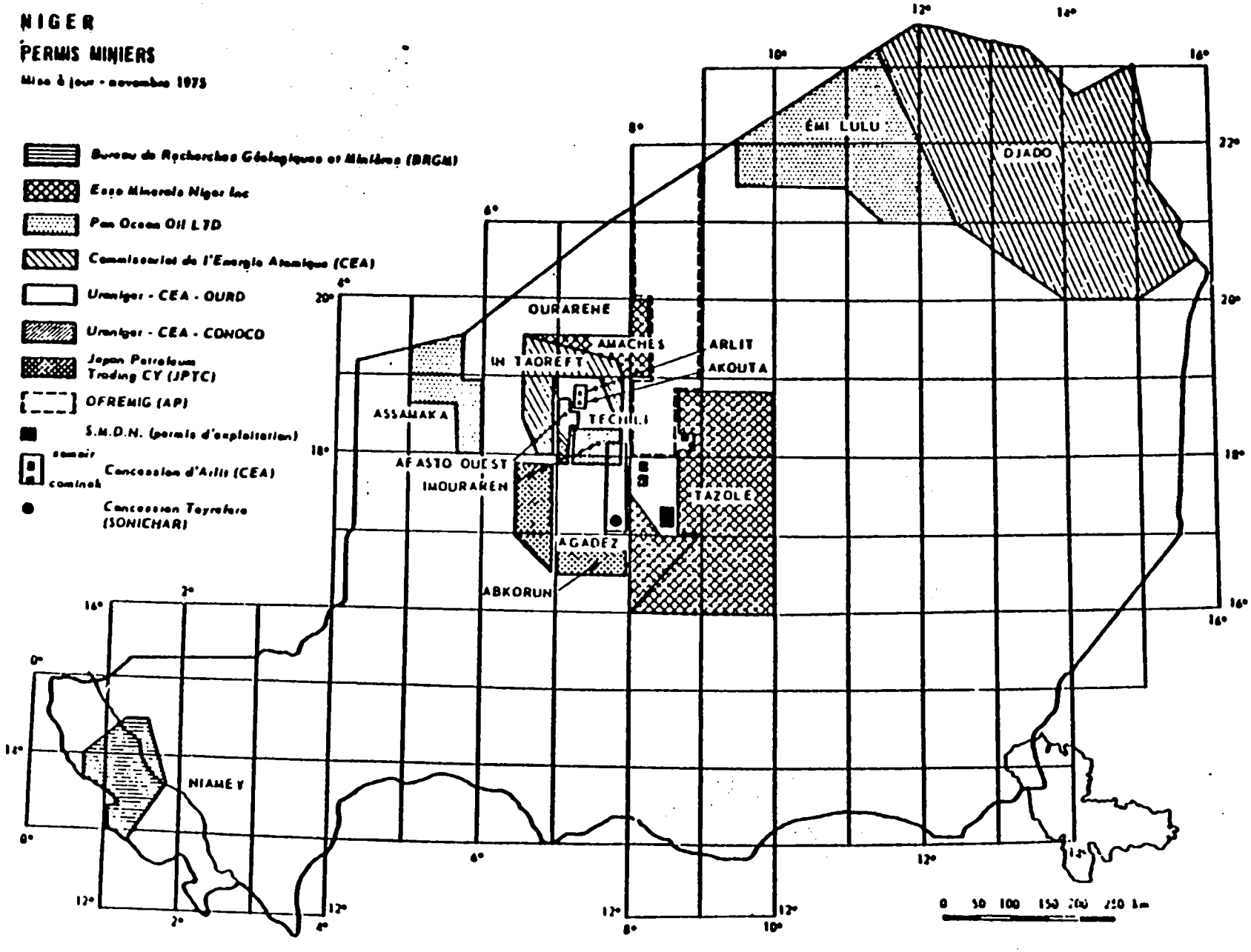
	1979	1980	1981	1982	1983
Production[a] (metric tons)	3600	4300	4500	4845	6635
Gross Export[b] Value (1) (millions CFAF)	87,480	100,620	105,300	117,733	161,230
Gross Export[c] Value (2) (millions CFAF)	87,480	109,189	119,412	134,351	192,269
Revenue[d] (millions CFAF)	21,870	27,297	29,853	33,587	48,067

Source: GON estimations and author's calculations

Notes:
a) Assume 100 percent of production for given year exported
b) Assume 1979 price through 1985 (constant prices)- CFAF 24,300
c) Assume 4.5% /annum increase (constant prices)

	1980	1981	1982	1983	1984	1985
(million CFAF)	25,393	26,536	27,730	28,978	30,282	31,644

d) Based on gross export value (2), assumes a 25 percent ratio of government revenue to gross export value



Niger-Mining permit map.