

# The quest for

**Mark Newham** looks at Middle Eastern efforts to join the uranium club. While the commitment to nuclear energy is clear, Arab uranium could prove uncompetitive in the present state of the market.

The fall in the price of uranium could markedly affect the economies of a number of Middle East countries, notably Algeria, which recently joined the world's uranium producers.

From a high of \$43 a pound in 1977 and 1978, the price of uranium fell to \$26 in 1981 and \$18.25 by July this year. With the exception of countries such as France, which is pushing ahead with its nuclear programme regardless of growing public hostility, the world's nuclear industry is at a watershed (see our August 1981 cover story).

Anti-nuclear lobbies and the rising cost of constructing reactors have forced governments to reappraise their nuclear programmes. Although most remain committed to the development of some form of nuclear power, there has been a noticeable wavering of confidence in nuclear technology.

Worldwide the number of reactor orders on the books of major nuclear construction companies has dropped as public concern over nuclear energy has risen.

But energy analysts are virtually unanimous in agreeing that nuclear power is the only reliable long-term alternative energy source available at present. Their view is supported by that of most energy agencies, which regard nuclear energy as a cheap, clean and virtually limitless power source.

They base their attitude on the opinion that uranium, the fuel used in nuclear reactors, is relatively abundant and cheap at present and will remain available in large quantities for the foreseeable future, especially with the development of the breeder reactor.

Breeders produce plutonium, a vastly more efficient fuel than enriched uranium and a material essential to the nuclear weapons industry. As raw uranium reserves decline

and prices rise, breeder reactors will inevitably become a vital part of future energy programmes unless the shift to a nuclear future is halted by considerations of safety and cost.

## Prospecting in the southern Sahara

Uranium in the Arab world is found in two forms – in veins of ore, which can be mined, and in association with phosphates, from which it can be extracted. Only Algeria, Somalia and Egypt have proven workable vein reserves.

Latest figures from the OECD's Nuclear Energy Agency and the International Atomic Energy Agency (IAEA) say that Algeria has approximately 26,000 tonnes of reasonably assured resources (RAR) of uranium which can be mined at a cost of less than \$80 a kilogram.

The agencies add that the country has no RAR of uranium in the \$80-\$130 a kilogram range, and no estimated additional resources (EAR) either above or below the \$80 level.

These figures differ somewhat from those announced a year ago at Oapec's fourth Arab Mineral Wealth Conference, which showed Algeria with 28,000 tonnes of RAR and 5,490 of EAR.

Although Algeria does not feature in the latest OECD/IAEA ranking of uranium producers, the agencies report that it is working open-cast uranium mines at Abankar and Aira and an underground mine at Timgaouine.

Up to 1,200 tonnes of concentrated uranium a year is expected to be produced by 1984 or 1985 from the 1,800 tonnes of ore to be mined daily.

Uranium extraction in Algeria is to be handled by two consortia. The first, Société Nationale Algérienne de Recherche et d'Exploitation

Minières (Sonarem), is led by the Cotecna Engineering Group of Switzerland and includes AG McKee of the US, and two Belgian concerns, Union Minière and Traction et Electricité.

The second consortium is composed of French companies led by Sogerem and including Société Technique d'Entreprises Chimiques (part of Pechiney Ugine Kuhlman), Minatom (owned jointly by PUK and Compagnie Française des Pétroles), Inter-G and Sofremine.

The OECD/IAEA report says neither Egypt nor Somalia has recoverable uranium deposits in the range of less than \$80 a kilogram, but that Somalia has RAR of 6,000 tonnes in the \$80-\$130 a kilogram range.

Somalia also has 3,400 tonnes of EAR uranium in the higher price range, and Egypt has 5,000 tonnes of uranium in the same category. Neither country has so far started producing any significant quantities of uranium.

Throughout the Middle East there is a total of 60,000 tonnes of RAR uranium and 9,000 tonnes of EAR, according to the Arab Mineral Wealth Conference. These figures are based on the extensive mineral exploration programmes that have been carried out by indigenous and foreign organisations since the end of the Second World War.

In Algeria prospecting teams from the Algerian Office of Ore Exploration found the country's first traces of uranium in the Hoggar mountains near Timgaouine in the southern Sahara. Further exploration was carried out by France's Commissariat à l'Energie Atomique up to 1960, and Sonarem completed a full-scale survey in 1974.

This revealed several uranium deposits, the largest of which were in the areas of Tahagarat, Tamart-n-blis, Timouzeline and Tin-serence in the Hoggar. Additional veins

are thought to exist in other parts of the Hoggar.

In Egypt uranium prospecting has been continuing since the late 1950s and vein-type deposits have been discovered in the Central-Eastern Desert and the Western Desert.

Detailed investigations have been carried out in Morocco since 1946, but it was only in 1979 that the first shows of vein uranium were found, in the Askawn region. Other radioactive horizons have been found in the Western High Atlas but so far no commercially-mineable deposits are known.

In Mauritania a number of French organisations, including CEA, CGG and Total, have been exploring for uranium since 1957. In the mid-1970s Mauritania's Directorate National des Mines et de la Géologie licensed a joint Japanese-French consortium to carry out detailed investigations in the northern part of the country.

Clashes between Morocco and Polisario in the Western Sahara forced a suspension of work, however.

More extensive surveys have been carried out in Somalia and Sudan. The UN Develop-

## World Uranium ( $U_3O_8$ ) Prices

Year	\$ per lb (nominal)
1950	9.2
1955	12.5
1960	8.8
1965	8.0
1970	6.2
1973	7.0
1974	15.0
1975	35.0
1976	41.0
1977	43.2
1978	43.25
1979	40.75
1980	28.0
1981	26.0
1982 (July)	18.25

Sources: MITEnergy Labs, Nuxco, Nukem

# Arab uranium

ment Programme (UNDP) started exploring in Somalia's Bur area and Mudug Province in 1964 and found uranium deposits in the early 1970s.

The UNDP has also been active in Sudan, where it carried out aerial radiometric surveys over 28,000 square kilometres and drilled 40 boreholes between 1968 and 1973 in the Hofrat al-Nuhas area.

Radioactive elements were discovered in copper deposits in the area and several exploration contracts have since been signed by the government with companies including Chevron, Menix, Texas Eastern and Korea's Daewoo Company for more detailed survey work. Many interesting survey results are known to have been obtained but few have been released so far.

It is known, however, that uranium-bearing geological formations in Sudan extend into the corner between Sudan, Libya and Chad. According to the Arab Mineral Wealth Conference, these formations "could offer predominant host rocks for uranium concentration".

Libya's insatiable appetite for uranium has often been

cited as the reason for its annexation of Chad's 9,000-square-kilometre Aouzou strip in 1975.

Libya is also believed to have discovered recoverable reserves in the Murzuk and Kufra basins and the area around Jebel al-Nwynat in the eastern Kufra basin is arousing particular interest. Just what Colonel Qaddafi wants with the substantial amounts of uranium being stockpiled by Libya has been the subject of wide and sometimes wild speculation over the past few months.

## Libya's ambitious programme

In the first half of 1981 Libya bought 1,212 tonnes of uranium from Niger and towards the end of the year it opened formal discussions with Madagascar on the joint exploitation of the latter's uranium resources.

Libya says it needs the uranium stockpile for its ambitious nuclear power programme but the sceptics are convinced that some has already been sold in Pakistan to be processed into plutonium.

Considering that uranium production worldwide totalled

49,000 tonnes last year, Arab production figures are far from impressive. Nor are the reserve figures significant in relation to world reserves of 2.3mn tonnes. But despite the Middle East's shortage of vein-type uranium it is well-endowed with phosphates containing uranium.

The Arab Mineral Wealth Conference in 1981 estimated that 3.6mn tonnes of economically recoverable uranium was contained in Middle East phosphate deposits, mostly in Morocco. Figures produced at the conference suggested that Morocco's 40bn tonnes of phosphates alone contain over 4mn tonnes of uranium, about 75% of the total uranium contained in phosphates in the Arab world.

The Arab world contains a total of 5.24mn tonnes of uranium in phosphates, more than 35% of the uranium contained in phosphatic deposits worldwide.

Although Morocco has the Middle East's biggest phosphate reserves, there are substantial deposits in a number of other Arab countries. Egypt has more than 3.3bn tonnes, the Western Sahara 3.0bn tonnes, Iraq nearly 1.8bn tonnes and Jordan

1.0bn tonnes.

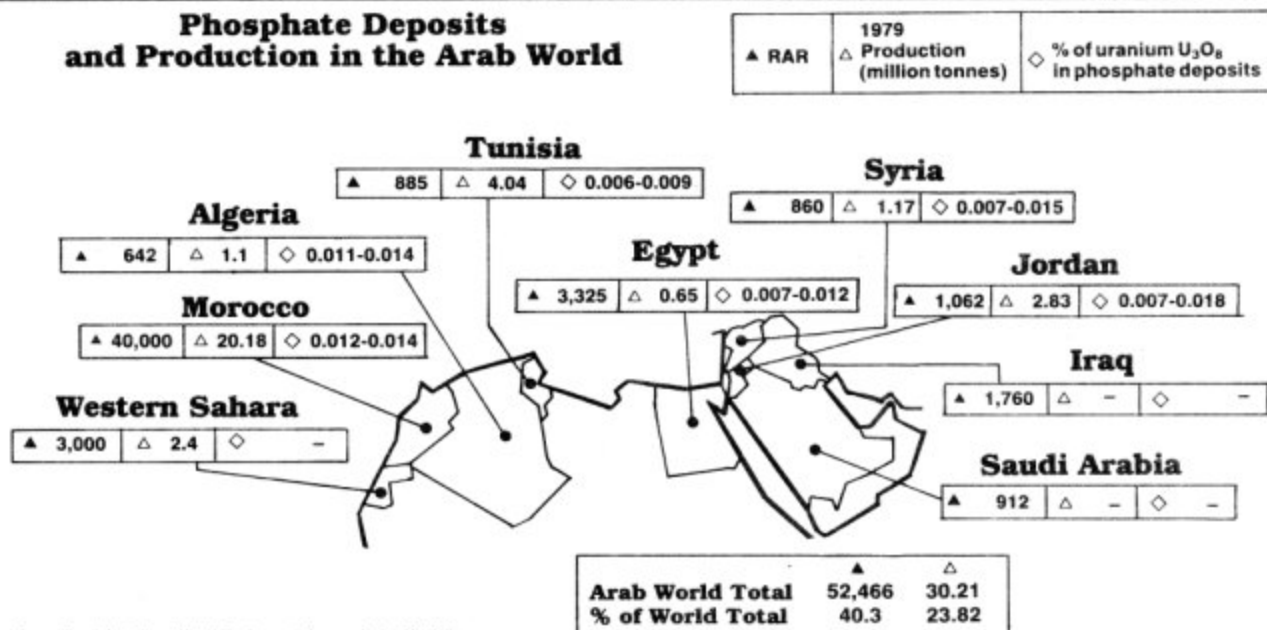
But is this uranium worth extracting? In the depressed state of the uranium market the answer would appear to be no. It is unlikely that Middle East uranium could be extracted at a price competitive with world prices, and the export market would be limited. This leaves only the home market.

Many Middle East countries have drawn up modest construction programmes for reactors which will need nuclear fuel. Home-produced uranium could work out cheaper than imported fuels, but there is a major snag.

All nuclear reactors are fuelled by enriched uranium. Unless Libya, Iraq or Pakistan already have uranium enrichment facilities, as many in the West believe they have, Middle East uranium will have to be sent to enrichment plants in the West before it can be used in the region's nuclear energy programme.

Joining the exclusive uranium enrichment club is not only difficult but expensive. This could in the long run prove a costly obstacle in the way of a nuclear-powered Middle East. □

## Phosphate Deposits and Production in the Arab World





# Walking a tightrope in the West Bank and Gaza

**Palestinian development projects are never far removed from politics**

By Mark Newham

**Palestinian boats in Gaza must be beached every night.**



**T**he car was trapped. Small boulders the size of sheep blocked the road just ahead. When the car reversed, it soon encountered a second rock pile that had been hastily thrown up a kilometre to the rear. The occupants had only one choice: get out, clear a path and brave the likelihood of a deluge of stone-throwing as intense as a mortar barrage.

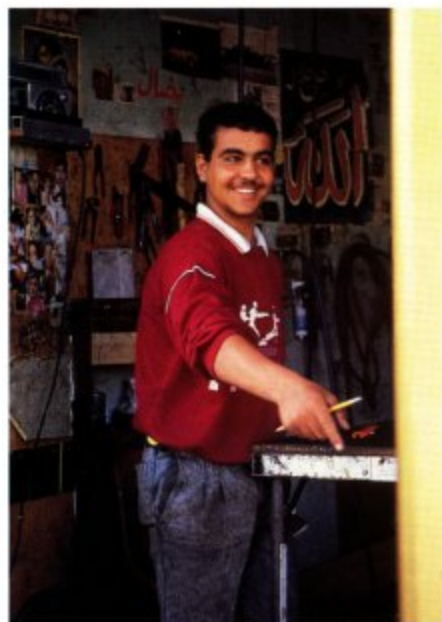
Avalanche? No. This was not the Alps or Himalayas. This was Bir Zeit, a village north of Ramallah in the Israeli-occupied West Bank, and this was March 30—Land Day—when Palestinians commemorate the deaths of six of their number in a protest over land rights in 1976.

Land Day has become a date of special significance on the West Bank and the Gaza Strip in the 18-month history of the Palestinian uprising—the *intifada*. Non co-operation with the occupying forces and Israeli settlers reaches its peak on this day. Palestinian businesses close their doors. Non-military transport stops—but not vehicles of the United Nations Development Programme (UNDP), whose neutral role compels it to remain above the Arab-Israeli conflict. UNDP's Programme of Assistance to the Palestinian People (PAPP), tries to function even on Land Day; the trapped car was attempting to ferry PAPP staff from their homes in West Bank villages to the office in Jerusalem.

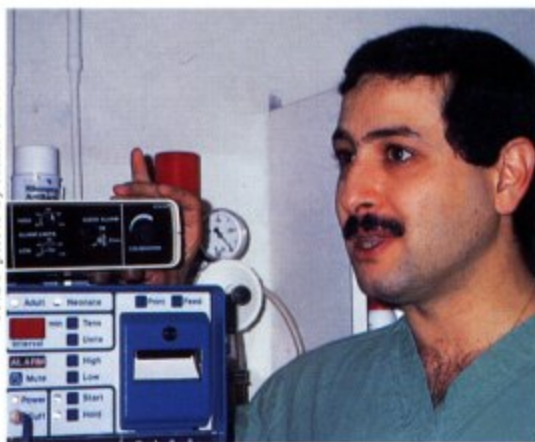
The rock barricade is symbolic of numerous obstacles PAPP has to deal with in its day-to-day operations in the West Bank and Gaza. The stoning of UN cars—unlike vehicles of the Israeli army, police and settlers—is not a regular occurrence, but it has happened. *Intifada* groups do not look kindly on UN vehicles travelling through strike areas. Hence the anxious moments spent clearing a path through the rubble blocking the road at Bir Zeit.

Strikes not only restrict UN staff movements but make precise project scheduling virtually impossible. PAPP's records reveal that a third of every work





**Left: Electronics course in Nablus trains Arab youth in new skills. Above: UNDP has helped build 44 classrooms for girls. Right: Dr. Yacoub Alul with new hospital equipment in Nablus.**



UNDP photo by Hans Olsen

Two-thirds of the US\$3.5 million cost of the project is being put up by UNDP and the remainder by AGFUND—the Arab Gulf Fund for UN Development Activities. A further \$20 million will be needed to install sewage and treatment facilities for high priority areas on the rest of the Gaza Strip and the West Bank.

For those who have already fallen prey to the unsanitary conditions, treatment at health centres throughout the occupied territories were, until recently, almost as rudimentary as the sewers. But working with the World Health Organization (WHO), PAPP has added new equipment to three hospitals and the Central Laboratory in the Gaza Strip. Four hospitals and a nursing training centre on the West Bank have also been upgraded.

Education and vocational training have been supported as well. UNDP has equipped 120 kindergartens, built 12 new classrooms for boys and 44 for girls, responding to the special need for improving education for women. Men now receive technical training in such fields as electronics and auto mechanics, while women are acquiring skills in hairdressing and secretarial services.

To date, PAPP has received over \$25 million from UNDP. Other contributions have come from AGFUND and the Governments of Canada, Italy, Japan

and Tunisia. The International Labour Organisation, WHO, and the United Nations Population Fund have also financed PAPP projects.

Still, PAPP's work in Palestinian areas is not always understood. While the main beneficiaries of the improvements have been Palestinians, these same beneficiaries have sometimes accused PAPP and UNDP of working "in league" with the Israeli government on health projects. The hospitals, they point out, are Israeli-owned, and hence it could be construed that UNDP money is being used to improve Israeli property when it should be going to Palestinians alone.

To function at all, PAPP is obliged by the Israeli government to have all its projects cleared by the Ministry of Defence, which in turn has overall control of the Occupied Territories. Delicate but firm negotiation is required for every project PAPP wants to support—an experience that PAPP Programme Director Nikitas Nevrodis has had time to perfect, having held the position since the programme's start in 1980. This helps explain why PAPP has been able to initiate politically sensitive projects like the building of a new fisheries complex on the Gaza Strip and the improvement of water supplies to villages on the West Bank.

"We don't operate like any other

UNDP office," says Mr. Nevrodis. "We're not accredited to any government. Neither do we deal with other UN agencies in implementing our programme, because they are not allowed in. Elsewhere, UNDP shapes its projects to fit into a country's overall development plan. Here, there is no development plan. We have to go out and identify our own projects."

Mr. Nevrodis needed all his powers of persuasion to obtain Israel's approval for a new fisheries complex on Gaza City's beach. The installation includes a modern fish market, an ice-making plant and a refrigeration store—all within a fishing rod's cast of an Israeli army post.

Yet, the fisherman's needs are only being partly met. Following the Camp David peace agreement with Egypt in 1979, the strategic importance of the coastal stretch along the Gaza strip prompted Israel to impose tight control over the area. In keeping with the agreement, fishermen need special Israeli permits to work the offshore waters, and are banned from being on the shore at night.

Before Camp David, over 1,200 fishermen worked an area of over 2,000 square kilometres, often casting nets as far south as the Egyptian ports of Alexandria and Port Said. Today, they are not allowed into Egyptian waters and





UNDP photo by Eva Arnvig

**Unemployed Palestinian youths wait for pick-up work in Jerusalem.**

week has been lost to disruptions of one sort or another since the *intifada* began. In order to aid employment and boost the local economy in the two territories, PAPP's policy is to award all construction contracts to Palestinians, and these contractors feel obliged to honour the strikes—which sometimes last for days on end.

To exacerbate the situation, suppliers in Israel, who offer the most reasonably-priced materials, often refuse credit to Palestinian contractors and demand cash on delivery—cash the contractor seldom has. Even when materials are finally procured, equipment is not always available to employ them. It is not unknown for the Israeli army to commandeer UN-contracted construction vehicles to clear *intifada* barricades.

Then there's the curfew. Neighbourhoods considered particularly troublesome by Israel are often put under curfew by the occupying forces for days at a time, with free movement permitted only briefly once a day. At such times, the only people seen on the street are women scurrying to gather provisions before the deadline is up. UN personnel are banned from entering curfew areas, which are often the very places that the PAPP team has pinpointed as in most urgent need of assistance.

Rashid Khouri, a PAPP engineer on the Gaza Strip, points to just such an area inside the Jabalia refugee camp as his car jolts along the pot-hole pitted road around the camp's perimeter. "In there," he says, "the effluent of more than 50,000 refugees runs through open drainage ditches to an uncovered lake of raw sewage in the middle of the camp. Children play by the lake so it's a big health hazard. We have a project to install sewage pipes and a pumping station to drain the lake, but since the camp is often under curfew, it's taking a long time to complete. It's under curfew right now."

Mr. Khouri stops at a pumping station just outside the camp where an old man, barely able to walk and with failing eyes, guards the gate. "We've just completed this pumping station," says Mr. Khouri. "It's working but we'll be handing it over to the Municipal Authority soon, and the Authority doesn't have the money or the staff to look after it properly. There should be at least one full-time technician here but there's only this old man."

The station is one of three in the area which will eventually pump the sewage of some 85,000 people in Gaza's northern region to a treatment plant near Gaza City. The system should be capable of handling the wastes of a population that is expected to double by the end of the century.



**Nikitas Nevrodis (right) conferring with Israeli social affairs officer Moshe Zagha.**



UNDP Photo by Eva Arnvig

Most heads of UNDP offices rotate every three years. Nikitas Nevrodis, 56, has been on the job at PAPP's office in East Jerusalem for more than nine years, a testament to his ability to get things done. One reason for his success is sheer endurance: a typical day begins at 6 a.m. and ends after 10 at night. The job also calls for unusual diplomatic skills, which Mr. Nevrodis, a Greek national, has sharpened during service in the Congo, Yemen, New York and Saudi Arabia.

Despite the frustration inherent in his work ("it comes with the territory"), the rewards, he says, are in seeing the results of UNDP's actions. "There is a hospital in Ramallah with operating room equipment we provided that save lives almost every day," says Mr. Nevrodis. "Considering what UNDP is about, these are the things that count."

their fishing area has shrunk to 468 square kilometres. The average catch has dwindled from up to 40 tonnes a day to little more than four tonnes, and the ice-making plant, capable of making 12,000 kg. of ice in one 12-hour shift, needs to operate only once a week to supply ice for the shrunken catch.

PAPP's staff at the complex retain an unshakable belief in the project, confident that Egyptian waters will eventually be opened up to the fishermen. Moreover, active negotiations are in progress to build a UNDP-funded harbour near the complex to reduce wear and tear on fishing boats, which currently have to be beached every night.

PAPP's water supply improvement scheme experienced similar delays at the negotiating table. In essence, PAPP

intends to link 22 West Bank villages to main water pipelines or install new water reservoir towers to regulate flow. Nine covered storage reservoirs are being built to overcome irregular supplies to 13 villages and it is these reservoirs which could be construed as politically sensitive. The occupying forces often cut water to troublesome villages in their campaign to quell unrest. But such tactics, as PAPP's water reservoir project engineer, Musa El-Khatib, points out, are effectively undermined by the reservoirs, which give the villages a two-day reserve of water.

Nevertheless, after months of intense negotiation, the project got underway in 1987, and PAPP is in the process of trying to expand it to cover more than 100 additional villages. Such an effort would require a further \$3 million on top of the \$868,000 already allocated.

That is petty cash compared to the funds needed to initiate all the projects PAPP wants to see in place in Gaza and the West Bank. Almost \$57 million is being sought for these activities over and above the \$14 million already committed for the 1987-1991 period.

Since it is the only intergovernmental development organization delivering substantial technical assistance to the West Bank and Gaza, PAPP identifies projects based on ideas from local municipalities and professional organizations, as well as followers of the Palestine Liberation Organization, as required by the UN General Assembly.

Despite problems emanating from both sides of the ideological divide, PAPP's delicate fence straddling appears to be working to everyone's benefit. Now that the foundations for development in the Occupied Territories are finally being laid, the time might be right to borrow a word from the *intifada* vocabulary—"soumoud"—meaning hold firm. ■

---

*Mark Newham is a London-based freelance journalist who writes about economic issues and sustainable development.*

#### **Close up**

### **The Man in the Middle**



# EGYPT'S COMPUTER PAYOFF

By Mark Newham

**F**ew development projects could have repaid their initial cost as swiftly as the US\$445,000 computer system installed in Egypt's Central Bank.

Furnished to help the Bank analyse and speed the servicing of Egypt's US\$40 billion debt, the computer system could theoretically pay for itself in less than half a normal working day. That's because interest on Egypt's debt accumulates at the rate of about US\$1 million every six hours.

Egyptian officials had a basic problem in sorting out debt rescheduling: how to actually calculate the total the country owed. Before 1987, funds borrowed were simply logged manually in ledgers at local banks. The numbers were eventually re-routed, often after long delays, to the Central Bank. Once there, the lack of automated systems for processing the data further delayed the production of simple statistical analysis.

The result was that Egypt's economists and financial administrators could not clearly determine exactly how deep in the red they were. Without this data, they could neither assess the mounting interest additions nor service the debt effectively.

Managing debt is crucial to containing it, a problem not limited to Egypt. Foreign debt of developing countries now exceeds US\$1,200 billion. The United Nations Development Programme (UNDP) currently supports more than 30 projects that help governments cope with debt. It has recently appointed a group of independent experts to study new ways of dealing with the problem.

Egypt turned to UNDP for technical support in 1985. Problems of keeping track of the debt arose mainly from decentralization. New loans were approved in isolation without consideration of previous and current obligations or overall economic conditions.

Work began with a complete survey of the country's indebtedness. The study revealed that the responsibility

for external borrowing was distributed among several official agencies, including the Central Bank, the Ministries of Finance, Economy, Defence and Planning and other agencies. Each had a limited and independent responsibility for certain parts of the public debt and there was insufficient communication among them concerning debt information. Each had its own records, methods of bookkeeping and management tools.

An expert from the International Monetary Fund (IMF) was called in, followed by a task force from the United Nations Conference on Trade and Development (UNCTAD). Once settled into the Bank's Loans and External Debt Department, the team lost no time in assessing the extent of the problem. About 25 per cent of Egypt's total export earnings were going toward debt service.

About 5,000 loan records were generated each year, the UNDP study states, but "each entity keeps records for its own purposes with little or no awareness of the need for regular exchange of information of the overall debt picture. Consequently, the type of comprehensive debt reports so vital to economic planners and policy makers are not available."

UNDP selected UNCTAD's well-proven debt monitoring and financial analysis system, already in use in 12 other debt-laden countries, to help Egypt. UNDP provided US\$300,000 for the computer system and its installation, while the Egyptian Government contributed another US\$145,455. In

October 1986, the first IBM personal computers arrived. A year into the project, six microcomputers were installed and 20 bank employees were trained to input data for analysis.

The process of collecting, collating and analysing the data has been cut from weeks to hours. The new system even pinpoints errors in records supplied for analysis. It provides greater accuracy and reliability than was ever possible with the manual data collection method.

UNDP photo by Mark Newham



**Erkki Vehakamaki, right, an IMF expert, shows a Central Bank employee some useful personal computer tricks.**

There are still deficiencies with the system — particularly in the standard of analysing the records. But the UNCTAD/IMF team is confident this will change as the Bank's staff becomes more familiar with the system. Efficiency will also improve now that the microcomputers are linked to the Bank's existing main-frame computer.



September 2, 1988

\* 670 words  
\* A map

## SUDAN NILE DISASTER SAVES EGYPT

The torrential rains that turned Khartoum into a disaster area requiring emergency life relief, have saved Egypt from the spectre of drought. But climatologists warn that drought rather than flood will become the norm and conservation measures must be adopted.

By MARK NEWHAM  
Compass News Features

The Nile floods which wreaked devastation in Sudan, sent life-saving supplies cascading into Lake Nasser at an unprecedented rate, averting the threat of water rationing and rescuing Egypt's ambitious desert reclamation programme.

But officials believe the relief will be temporary and the country must use the respite to enact serious water conservation measures.

Climatic changes mean that drought will become the rule rather than the exception in the river Nile source areas, analysts believe.

(more)