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OVERSEAS NEWS

Mark Newham reports on the creeping desertification of west Africa

Desert sands march into Sahel green belt

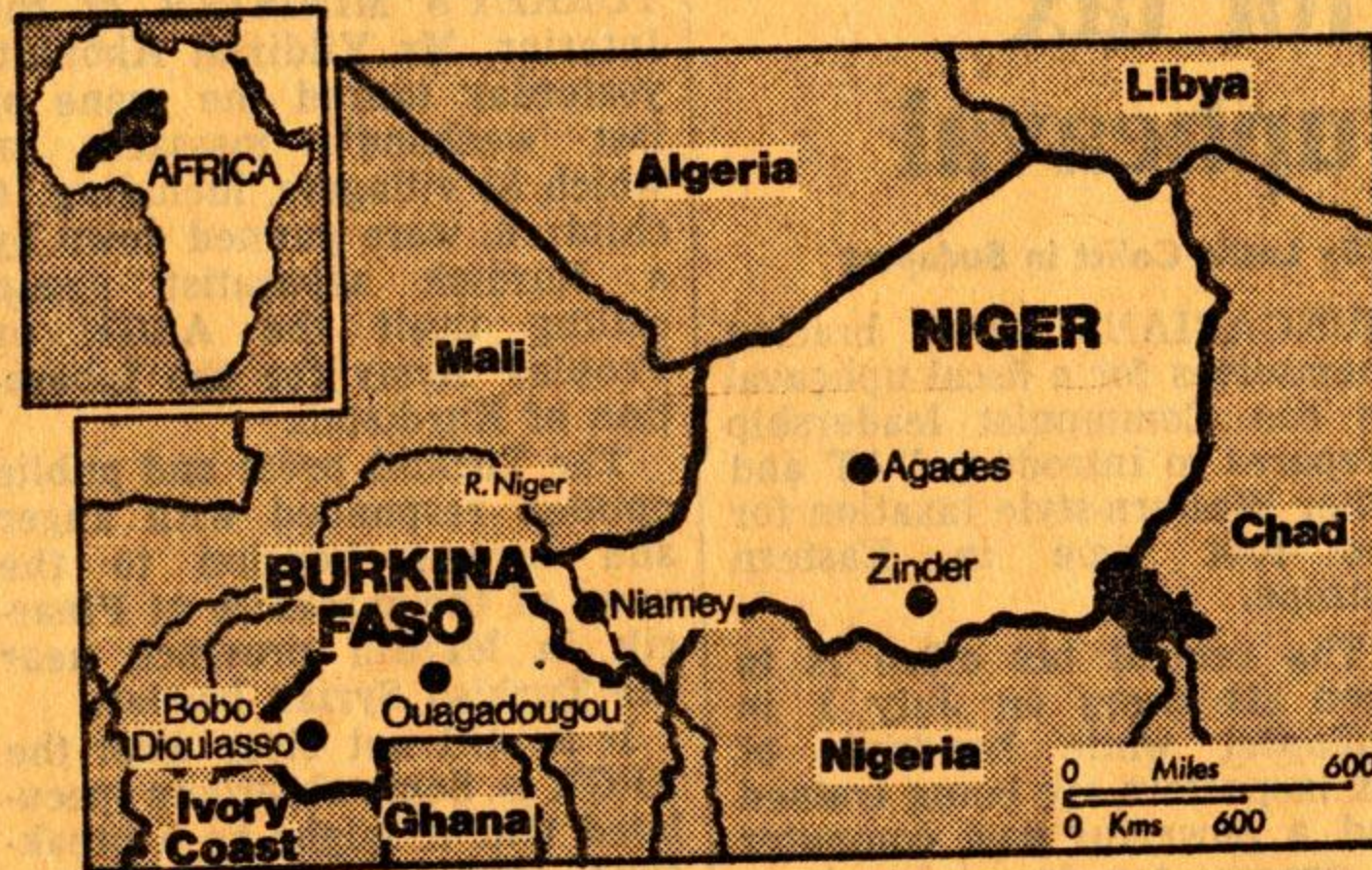
OURSI is not a desert town yet. But the tide of sand sweeping down from the Sahara threatens to engulf this remote northern outpost of Burkina Faso unless urgent action is taken.

Already, vivid ochre-coloured dunes have swamped vast areas of fertile pasture which, until the early 1960s, supported extensive cattle herds and gave the farmers of Oursi twice as much grain each year as the town needed. Oursi was once a granary of the Sahel — the fragile strip of transition between the Sahara and the African savannah — but is now a net grain importer.

To compound the problem, the dunes have blocked the inlets to Oursi's lake. All that is now left of an 8 km reservoir where a fishing industry once thrived is a muddy strip where goats and donkeys paw the ground in a futile search for the water the town once took for granted. This is the tragedy of the creeping desertification overtaking the Sahel at a rate estimated at somewhere between 16 km and 40 km a year.

Oursi's elders blame climatic change. Government officials think they know better. Research has shown that desertification in the Sahel is caused primarily by the booming population overgrazing and over-cultivating the land. Deforestation leads to soil erosion and, as the soil is blown or washed away, the desert gradually takes hold.

Reforestation on a massive scale is needed, but it is no simple task. The governments



and research organisations involved are far from understanding the nature and extent of the problem. There are no reliable figures on the rate of desertification of the Sahel, and no data on how fast the Sahel is losing its natural vegetation.

Even the Permanent Interstate Committee on Drought Control in the Sahel (Cilss), a grouping of the 10 countries from Cape Verde in the west to Chad in the east—has yet to piece the jigsaw together. According to Burkina Faso's Cilss co-ordinator, Mr André Roch-Compaore, the organisation simply does not have the resources to set up monitoring stations to track the desert's spread.

"We have to rely on sporadic reports from the affected

regions, but even these represent only part of the problem since the process of desertification also starts from within the Sahel. It is not just the Sahara's fringe expansion that we have to take into account."

The United Nations Food and Agriculture Organisation has produced some figures on the problem but even these are given only guidelines status by CILSS. In the case of Niger and Burkina Faso, the FAO estimates that each country lost about 60,000 hectares of natural vegetation a year between 1980 and 1985 while, in 1985, Burkina Faso had 22,000 hectares of reforestation projects under way and Niger had 14,000 hectares.

In Niger, most of the replanting is being carried out within 100km of Niger's capital,

Niamey, but as fuelwood plantations to feed Niamey's insatiable and growing demand for firewood and not as a green barrier against the Sahara's southward spread. Furthermore, the species being planted, largely the fast-growing eucalyptus, is widely regarded by forestry experts as largely detrimental to the fragile soils of the region. The species returns little of the nutrients it uses in its growth and after a few seasons of harvesting, the soil can be left more barren than it was before planting.

In Burkina Faso, the country's environmental advisers have at least recognised this problem, largely through the bitter experience of a failed 2,000ha eucalyptus experiment near Oursi. In a newly-created reforestation project being funded by the UN Development Programme and by West Germany, 15 areas in three of the country's most threatened regions are to be the subjects of projects incorporating the planting of 400ha areas of naturally-occurring tree species and comprehensive programmes designed to demarcate specific areas for cropping, grazing and urban development, and sensitise the population to the dangers of overstepping the supportive capabilities of the land.

The Government has also introduced a state-run wood supply agency in an effort to outlaw the anarchic practises of the cowboy woodcutters.

But it is not just indiscriminate tree felling that is worrying

the authorities. Farmers are pushing further and further towards the extreme limits of the Sahel's potentially fertile land in an effort to feed themselves. One organisation now experimenting on a 500ha research farm in Niger believes it has the answer to the problem.

The International Crops Research Institute for the Semi-Arid Tropics says lack of soil fertility, especially the lack of phosphate in the soil, is a greater problem for agriculture in the Sahel than lack of moisture. Even in the driest regions, the crop yield could be doubled or trebled if farmers added phosphate fertilisers and farming efficiencies could be increased by 75 per cent with the use of simple mechanised equipment and animal traction.

Icrisat was partly responsible for the green revolution in India but "the Sahel should not expect a similar miracle" says the organisation's executive director, Mr Ron Gibbons. India simply had better resources than the Sahel the suggested techniques were applied with great vigour and the country's scientific establishment went to great lengths to see that Icrisat's research data was widely distributed.

In the meantime, the inhabitants of Oursi are concerned only about two issues — where tomorrow's food will come from and whose house will be the next to be engulfed by the desert sands.

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THE FALKLANDS CRISIS

Mark Newham examines prospects for the exploration of oil and mineral reserves in Antarctica

Potential wealth of the continent yet to be charted

ANALYSTS of the Falklands crisis have stressed that the taking of the Falklands by Argentina could be the first step towards the ultimate domination of the Antarctic by the Argentine junta. They base their assumptions on reports that Argentina covets the immense mineral wealth thought to lie below the glacial ice of the southern continent.

Have these analysts got their sums right? That was the question posed recently at a special meeting of the Royal Geographical Society (RGS) called to give the opinions of experts on the Antarctic and the South Atlantic a long-overdue airing. The experts' answer was loud and clear. There may be large mineral reserves in and around Antarctica but can they be commercially developed?

Dr Charles Swithinbank, head of the British Antarctic Survey's (BAS) Earth Sciences Division, presented a clear picture of the situation. Only 20 per cent of the continent has so far been charted on a scale large

enough to be useful for mapping out geological and mineral resources, and much of that has been carried out by the BAS in the Antarctica peninsula. So far, BAS has found shows of a wide variety of metallic minerals including copper, zinc and tin, but cannot base any estimate of likely reserves on these investigations alone.

The BAS research programme has yet to include plans for detailed seismic and drilling work and, without data from such studies, no one can be sure of the extent of the continent's mineral riches.

Dr Swithinbank pointed out that, as well as the technical problems involved in drilling through continually shifting glacial ice into bedrock, there are the legal difficulties surrounding ownership of results of test bores. Who do operators go to for a licence to drill? Will the data they obtain remain their property? What is to prevent a commercial or political competitor setting up his drill rig next to theirs?

Without the assurance of legal ownership over their work, no investor in his right mind is going to put money into detailed exploration of the Antarctic, he said. And, without such detailed geological investigations, the Antarctic continent will remain the largely unmapped glacial desert it is today.

BAS is doing its best with the limited financial support it receives from the British Government to remedy the situation but, after 30 years' work in the region, Dr Swithinbank said: "There are better maps of the dark side of the moon than there are of the Antarctic."

The one area for which moderately well-defined maps do exist is the Antarctic peninsula — the area claimed by the UK, Argentina and Chile. Dr Swithinbank is in no doubt about the area's rightful owner. "The BAS has carried out 95 per cent of the geological investigations on the peninsula," he said, "besides which Britain

registered its claim in 1908 — 35 years before Argentina's claim and 32 years before Chile."

In an effort to allay the squabbles over the disputed regions, the Antarctic Treaty was drawn up in 1959 to keep all territorial claims in abeyance "in the interests of international co-operation for scientific purposes." The Treaty has so far been largely respected but, while scientists from the UK, the U.S., the Soviet Union, Argentina, Chile and Poland pursue their research work in international harmony, the politicians are equally busy concocting wide-ranging documents to back up their claims to the disputed areas.

Some, like the British, Argentines and Chileans, claim only a slice of the continent. In the case of the South American claimants their slices overlap with part of the territory generally regarded as being within Britain's sector. The practical implications of this rivalry have been kept to a minimum so far,

with all countries established on the Antarctic having free reign over other national "territory."

Like many other claimants Argentina bases its arguments in defence of its rights on lines drawn to the South Pole from the extreme eastern and western points of its territory, including offshore islands. Here lies the importance of Argentina's attempts to wrest from Britain the Falklands' dependencies of South Sandwich and the South Georgias, which were joined administratively to the Falkland Islands only in recent times.

Unless the Antarctic Treaty is nullified by the battle for the Falklands, none of the signatories will be able to argue the terms of the Treaty until 1996 — the date set for the next round of negotiations over ownership of the disputed regions, when signatories of Treaty can withdraw their support.

Arguments over territorial sovereignty may result in countries like Argentina pulling out of the Treaty, but there will be

little to fight over on the Antarctic continent. It could be another 100 years before any resources lying beneath the Antarctic ice are developed on a commercial scale, partly because the offshore oil resources will take precedence over onshore mineral deposits. But even these offshore oil reserves, which could be from 15 to 50bn barrels according to the assessments by the U.S. Geological Survey and Gulf Oil, will take many more years to develop.

First will come the harvesting of the region's only proven resource: immense quantities of krill (a crustacean similar to a shrimp) found in the sea around South Georgia and south to the Antarctic peninsula.

Present-day reserves of krill in the region, according to Dr Inigo Everson of the BAS Marine Biology Division, far exceed the existing world catch of fish. It is a resource which could easily rival oil and minerals in importance, but it is as yet under-used by man.

WORLD TRADE NEWS

Mark Newham reports on plans for the world's largest single wind energy project Californian breezes blow Europe's sails

INSTALLATION WORK has begun on the first of 1,800 wind energy turbines shipped from Europe to California. In what will become the biggest single wind energy project in the world, Comapro Holdings of Berne plans to invest up to \$3bn over the next three years in installing 900MW of European wind turbines at four locations in California.

Contracts are currently being negotiated for wind power machines from companies in West Germany, Denmark and Austria. When complete, the project will almost double California's existing wind power output, which currently stands at 1,200MW.

Comapro believes that the time is right to bring wind energy to the forefront of the world's power supply industry. It has chosen California as the location for its first large-scale wind project. Wind energy is already an accepted part of the

state's power supply, and Californian utilities are legally bound to buy power offered to them by the owners of wind turbines.

European wind turbines have been chosen for the project since Comapro considers that no suitably sized US-made wind turbines are available. The Swiss company wants to use turbines in the 500-600kW range rather than the smaller rated output machines.

In the project's first phase - due to start in early 1988 - machines from Wagner Rotor of West Germany and Villas Styria of Austria will undergo stringent test runs to prove their reliability. When Comapro and its US arm, Aeroelectric Corp, are satisfied that the machines work satisfactorily, contracts for large numbers will be awarded to the companies concerned. Tests will also be conducted later on wind turbines developed by Messerschmitt

Bolkow Blohm (MBB) of West Germany and Bonus of Denmark.

A single Wagner Rotor 330kW machine has already been tested at Altamont Pass in Cali-

Utilities are legally bound to buy power from wind turbines

fornia and results show that the design can be pushed to produce 600kW under the right wind conditions. Early in 1988, three 500kW Villas Styria turbines will be tested at San Geronio.

Once the Wagner Rotor and the Villas Styria machines have proved their reliability to Comapro, it is understood that up to 900 Wagner Rotor and 270 Villas Styria devices will be ordered for the project over the succeeding two to three years. The turnkey cost of building and installing each Villas Styria machine is put at \$750,000.

while the cost of the Wagner Rotor machine is put at \$230,000.

Villas Styria plans to start manufacturing at its engineering plant at Eisenerz, Austria, at the rate of 10 turbines per month while construction of the Wagner Rotor machines will begin next January at the French plant of the West German engineering company Koch.

The project also envisages the inclusion of pumped water storage to make use of power generated at off-peak periods to fill a reservoir. At peak power periods water will be released through hydro-electric turbines to generate up to 30MW which will be sold to local utilities. The inclusion of this system will maximise the project's income from electricity sales and make it competitive with fossil fuel-fired generating plant.

According to Mr Hans Aebi,

Comapro's vice chairman, finance for the project is being sought mainly from Austrian banks which, he says, are enthusiastic about the prospects for wind energy projects

The project has already aroused considerable interest in power supply and wind energy circles. It is understood that discussions are now taking place between Comapro and Britain's Wind Energy Group over a proposed joint venture between the two to enlarge the Wagner Rotor machine to generate up to 1MW.

The outcome of the scheme, and especially the performance of the Villas Styria machine, is being closely monitored in Austria since Villas Styria is the first product of Austrian privatisation. Owned by Villas-Construct, Villas Styria was formed when the wind energy branch of the giant state-owned company Voest Alpine was hived off in 1986.

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DEVELOPMENT AND THE ENVIRONMENT 2

THE GAMBIA AFTER THE DROUGHT

The Sahel drought of the late 70s wrecked the Gambia's economy. Rebuilding the country's agricultural base so that it will at least be self-sufficient in food meant taking some very hard decisions.

By Mark Newham

A root-crop, the groundnut represents Abdullah Kome's income, and a bundle of dead tree roots piled outside his two-room, clay-brick house, his fuel. Sizeable piles of both represent luxury to Abdullah, his wife and three children, all struggling for survival in Juffure in the Gambia in the aftermath of the disastrous Sahel drought of the mid-1970s.

Jola, Abdullah's wife, remembers when she did not have to walk five miles for firewood or for a jug of water from the well whose level is still dropping. Five years ago, before the drought, Abdullah's family could gather all the wood they needed from a square mile around their plot of savannah land, and water could be drawn from a well in the village. And Abdullah, a Moslem, like 90 per cent of the Gambia's population, remembers when the rains were regular which gave his country a small trade surplus and the Gambian Produce Marketing Board the ability to pay a good price for his groundnut crop.

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