

around 420,000 million lira (£180 million).

Under the previous government, CNR also lost control of university research (that is, research in universities outside CNR laboratories), which is now in the hands of the national council of universities (CUN), where the same professional groups take similar decisions but outside the CNR bureaucratic structure.

Tesini's reforms, now before parliament, would revitalize the crumbling structure of CNR. Already CNR is spending an increasing part of its budget on applied projects, the latest list of seven amounting to 300,000 million lira over five years. (Two examples of these projects are an effort to increase Italian agricultural productivity, particularly in the south, since Italy is a nett food importer; and a recently completed project to develop an electronically-controlled fuel-efficient engine in collaboration with Alfa Romeo.)

But Tesini does not want to make CNR entirely into an organ of industrial research. "It would be dangerous to create a gulf between university work and CNR" he says.

Now the future of CNR is in the hands of parliament, but in the nature of Italian politics it may be two weeks or a year before the vote is taken on the Tesini reforms, by which time his government may well be out of office and a new minister in place to take the credit.

Robert Walgate

Humid tropics

Cautious growth

Washington

In a report released last Thursday, the National Academy of Sciences has recommended cautious but expanded development in the humid tropics. The study, commissioned by the US Agency for International Development*, found that concern over the environmental consequences of tropical deforestation is legitimate, but often overstated, and moreover that development is inevitable. Ninety per cent of the world's population increase from now to the end of the century will take place in the tropical countries — an addition of 1,500 million people.

One of the main messages of the report is that despite the inherent difficulties in managing tropical areas — and the study recites them all, including annual rainfall of 5–35 feet, tremendous species diversity, and poorly understood ecology — new technologies are appearing that can get around these problems.

According to Dr Pedro Sanchez of North Carolina State University, a member of the panel that prepared the report, some myths about tropical soils need to be dispelled. He points out that "there's nothing fundamentally different in the agronomy between the humid tropics and the south-eastern United States. Contrary to myth", he adds "tropical soils though often infertile and acid are not fragile. They are

Private help

Washington

In a move that will help fill the void left by the Reagan Administration's cutbacks in environmental research, a private group — the MacArthur Foundation — has stepped in to offer \$15 million for a new research organization. The Institute for World Environment and Resources will concentrate on issues in global ecology such as species loss, inadvertent climate modification, desertification, deforestation and population.

A key government agency that had been following long-term global issues, the Council on Environment Quality (CEQ) was cut back to a bare-bones staff as soon as President Reagan took office. The director of the new institute, James G. ("Gus") Speth, was chairman of CEQ under President Carter.

The institute, which expects to begin operations by October, will however attempt a broader and more scientific approach than CEQ has taken. It seeks to bring together scientists from the physical, biological and social sciences to work on interdisciplinary problems of significance to public policy.

Although the institute will be based in Washington, roughly one-quarter of its \$4 million annual budget is expected to go to established research contracts with university centres of expertise in the environment and resource fields.

Stephen Budiansky

not especially low in organic matter nor especially prone to erosion. A lot of the erosion pictures in the popular press are 'civil engineering erosion' pictures taken around roads and drainage systems".

Sustained agriculture on cleared land does, however, require careful management and new technology, in particular continuing application of fertilizer. Sustainable agriculture, as opposed to traditional shifting cultivation, is considered the key to attaining the greatest benefit with the least deforestation and thus the least environmental disruption.

Still, much may be possible through the fine-tuning of indigenous technologies. For example, the traditional slash-and-burn method of clearing turns out to be much easier on topsoil than are bulldozers, and furthermore provides free fertilizer in the form of nutrient-rich ash.

Dr H. Garrison Wilkes of the University of Massachusetts, Boston, another panel member, points out that too little has been done to exploit and improve on tropical germ plasm resources. "The amount we know about cowpeas," he says, "or other tropical crops such as casaba, palms, tropical cabbages is very small — so the potential for genetic improvement is tremendous."

Stephen Budiansky

**Ecological Aspects of Development in the Humid Tropics* (National Academy Press, Washington DC, 1982).

Soviet agriculture

Food for all?

The Soviet Union's new food production programme designed to make Soviet food production match demand was announced last month at a plenary meeting of the Central Committee and introduced in a major speech by first Secretary Leonid Brezhnev himself.

To avoid emergency purchases from the non-Socialist world while this drift from agricultural to industrial employment continues will demand a major investment in agricultural research. Several lines of investigation are specifically mentioned in the programme, but their implementation is formally entrusted to the leading Soviet scientific bodies — the Academy of Sciences, the Lenin Academy of Agricultural Sciences and the State Committee for Science and Technology.

According to the programme, however, the practical work is to be the responsibility, primarily, of the network of "scientific production associations" set up in the past few years to link research and development organizations with production enterprises. These associations are to form the basis for the production of high quality and hybrid seeds and plants of "superior reproductive quality" as well as the rearing of pedigree cattle for state and collective farms.

The targets laid down by the new programme are precise: varieties of winter wheat must be developed with a yield of not less than 80–90 q ha⁻¹, spring wheat of 45–60 q ha⁻¹, maize hybrids of 12–130 q ha⁻¹ on irrigated land and 80–90 q ha⁻¹ on non-irrigated land and peas of 40–45 q ha⁻¹ (1q = 100 kg). Fodder crops must yield 10,000–15,000 fodder units per hectare under irrigation and 5,000–6,000 fodder units without, while technology or fodder storage must ensure retention of at least 90 per cent of nutrients.

In addition to these precise targets, there are less specific directives. Research is to be directed at saving energy in soil conservation, the rational usage of water resources, anti-pollution measures and the mass examination and treatment of animals. Special attention is to be paid to the development and mass production of biological and chemotherapeutic veterinary pharmaceuticals.

To support this applied research, the two all-union academies, together with the republic academies of sciences, are to develop theoretical work in genetic engineering. This will include the breeding of new strains of plants, microorganisms and animals, the biotechnology of protein synthesis and biologically active substances. The academies will also be responsible for new pesticides and herbicides, growth regulators and similar sophisticated agricultural preparations, and for designing the industrial technology for their commercial preparation.

Vera Rich