

Portugal's science plots its future

Research in Portugal has grown apace over the past decade, and the government is reviewing its achievements, problems and prospects.

Portugal's Ministry of Science and Technology (MST) has launched a nationwide consultation on how the country's science and technology should develop over the next seven years.

The consultation is based on a 'white paper', made up of a series of working documents. The government is seeking comments and proposals from public and private research centres, and from groups such as public authorities and private industry.

The ministry has set up a web-based Forum on Scientific Policy to conduct consultation. The website includes a letter to Portuguese scientists from the research minister, former physicist José Mariano Gago, explaining the country's short- and medium-term research objectives.

Gago hopes to stimulate debates that will produce information on the development and resources of different disciplines. The Observatory of Science and Technology (OST), a body based at the MST, will coordinate the collection of data on the nation's science and technology.

Cooperating with Europe

Based on the results, the MST will complete an Integrated Programme of Science and Technology, review the implementation of the 1988 Law of Scientific and Technological Development, and prepare the next European Commission programme of support for science and technology.

Gago says that the white paper's main conclusions already form the basis of the new Scientific and Technological Development Programme (2000–2006), which has been approved by the government and will be presented to the commission shortly.

It includes two interrelated operational programmes: the first, called Science Technology Innovation, has a budget of 192 billion escudos (US\$1 billion); half of this will come from the Portuguese government and half from the European Union. The second, Information Society, has a budget of around 140 billion escudos and will be funded from the same sources.

The provisional versions of these programmes were made public at the end of July. Gago says that they will be formally submitted to Brussels within a few weeks.

The white paper includes a report, put together by the OST, which describes Portugal's science policy over the past few years and its future objectives in research and technology, including a special section devoted to information technology.



On the up: the Universidade Nova de Lisboa. Gago (inset) is consulting on science policy.

The report also analyses the international activities of Portuguese scientists. In 1996, 49 per cent of the publications with Portuguese coauthors appearing in international scientific journals were international collaborations, up from 28 per cent in 1980–81.

The white paper includes 'research profiles' covering physics, mathematics, chemistry, health, engineering and environmental science, produced by Portuguese specialists nominated by the ministry. These experts are the same as those who coordinated 20 international evaluation panels that assessed the performance of publicly funded research units three years ago (see *Nature* 387, 115; 1997).

The earlier evaluation consisted of an analysis of the resources and achievements of individual research units, visits to the units and a final report with recommendations for each field.

The reports assessed, with the aid of the OST, the scientific potential of each field and gave information on research activities, human, technological and financial resources and the strengths and weaknesses of research units.

The white paper 'can help show the weak points in the system'

Most of the experts involved agree that the panels were useful, rigorous and fair, although some suggested there should have been more experts from outside the European Union, especially from the United States.

But Gago says that some scientists told the ministry that the proportion of US experts was too high, and that they should be replaced by Europeans. The evaluation will be repeated every three years — the next is being carried out over this month and October.

Careers and communication

Carolino Monteiro, a human geneticist at the Universidade Nova de Lisboa, says that the white paper is "a very important incentive for the Portuguese scientific community, as people can start to talk and give their opinion".

Edgar da Cruz e Silva, director of the Centre for Cell Biology at the Universidade de Aveiro, thinks the white paper is "a very interesting exercise that can help identify the weak points of the system and sort problems out, not only in a given research unit but also externally".

The move reflects the MST's efforts, led by Gago since 1995, to reform Portugal's scientific system. Already there has been a ten per cent annual average growth in the number of PhDs, a 14–16 per cent annual growth in the public research and development budget since 1995, and a trebling in the number of Portuguese publications cited in the Science Citation Index over the past decade.

Despite this progress, some of the contributions to the white paper warn of a lack of coordination of research in Portuguese universities. Cruz e Silva says that in 1995 his university set up an 'institute of research' made up of all the research units.

"So far, the experience shows that such an institute has been very useful in managing and coordinating science and technology activities in the Universidade de Aveiro," he says.

Monteiro is worried that many Portuguese scientists cannot find research posts after their postgraduate or postdoctoral training. The white paper's reports — supplemented by the coordinators of the evaluation — reflect these concerns.

The report concludes: "Appropriate recruitment policies appear to be urgently needed to achieve not only a sustained expansion of the system, but also progressively younger research personnel." **Xavier Bosch**