

## Science in Nepal

## Poor outlook for development

## Kathmandu

NEPAL is trying desperately to emerge from centuries of backwardness by creating a base of science and technology to sustain its economic development. The King of Nepal himself, Birendra Bir Bikram Shah Dev, has lent his weight to the current enthusiasm for a technological leap forward. As chancellor of the Royal Nepal Academy for Science and Technology (RONAST), he has asked the academy to formulate a national policy on science and technology, including the creation of national laboratories, the co-ordination of research and the creation of a national information system. But in spite of the academy's links with sister academies in the region and with the newly-created Third World Science Academy in Trieste, not to mention the bilateral assistance of industrialized countries elsewhere, the obstacles are formidable.

The new laboratories to be set up in Nepal include a national instruments laboratory with assistance from Japan, a laboratory for research in hydrology and hydraulics with West German assistance and a planetarium at Kathmandu with help from India. The last of these projects fits in with the priority programme.

Using a \$30,000 grant from the International Development Research Centre of Canada, RONAST has also launched a project for increasing the awareness of the country's 16 million population of science and technology. RONAST has trained some 40 science journalists in the print and broadcast media and has launched a science features service. Its weekly radio programme on science topics has become instantly popular.

Nepal's annual science budget is a meagre \$300,000. In the absence of an industrial culture, there is very little applied research activity; the economy depends mainly on agriculture and tourism. The government's stress is on the development of appropriate technology for people who mostly live on mountains. The Rural Energy Centre for Appropriate Science and Technology (RECAST) has trained potters in the manufacture of smokeless stoves, 12,000 of which have now been installed in rural homes. The target by 1990 is 160,000 stoves.

RECAST is also converting the 25,000 traditional watermills by redesigning the turbine blades to double their efficiency. These watermills make use of the flow in streams and waterfalls to produce mechanical or electrical power for oil extraction or for dehusking foodgrains. Apart from biogas plants and solar water heaters, RECAST has developed technologies for making cement from rice husk and using bamboo for reinforcing concrete. Now it is

engaged on developing a suitable device for taking drinking water from the low-land streams to people living in the mountains. At present, the hill people not only trek for fuelwood but spend hours in carrying water uphill.

The biggest obstacle in building a scientific base in Nepal is its totally inadequate scientific and technical manpower. Up-to-date figures are not available, but according to 1982 statistics collected by the National Council of Science and Technology, the country has fewer than 4,200 scientists. The breakdown is agriculture 754, engineering 1,371, forestry 175, medicine 624, natural science 1,027, technology 104 and veterinary science 85. The total number of PhDs in Nepal is fewer than 100. The king personally presents a gold medal to anyone awarded a PhD.



*A Nepalese water-mill, grinding maize.*

Nepalese students wanting to go for higher studies have to go to universities abroad since the Tribuvan University, the country's only university, offers science courses only up to graduate level. The first batch of civil engineers from Tribuvan came out last year and the first batch of medical doctors will graduate next year. There is virtually no research in the university science departments and the laboratories remain shut most of the time. Said one senior professor, "I teach two hours a week and, during the remaining 40 hours, have no work". Very few students want to take up research because there are no jobs.

A senior official of RONAST admitted that lack of trained manpower is a major hurdle in the country's ambitious plan to build a viable infrastructure for research and development. It has been planned to set up a science campus, affiliated to Tribuvan University, in each of Nepal's

five development zones. But more important, according to some scientists, will be the reorganization of the university itself, where teachers and equipment are idle.

Nepal is a typical study of how massive development aid and imported science can fail to help a poor country to develop. For three decades, numerous international agencies along with their own advisers, experts and prescriptions for development have been steering Nepal on the road to progress and industrialization. Even today, 70 per cent of all health, agriculture, forestry, education and other development projects are foreign-funded and directed by overseas advisers estimated to number 480. But despite the massive scientific and monetary inputs from the developed world, most Nepalese continue to be poor, illiterate and unhealthy. Agricultural productivity has in fact declined and industrialization remains a dream. Foreign aid and the role of experts has been the subject of several debates and seminars in Kathmandu. One seminar in 1983 organized by the independent Integrated Development Systems (IDS) concluded that experts and advisers have their own existence without really trying to improve the skills of the natives, and that foreign-aided development projects mainly benefit the government bureaucrats associated with them.

According to P.K. Adikari of the National Commission on Population and one of the participants in the seminar, officials like to work in foreign-aided projects because they are tempted by the imported cars, foreign travel and prospects of scholarships and studies abroad. "The problems we have are peculiar to Nepal", says IDS director Dr Devindra Raj Panday; "No amount of foreign money or advisers can solve them."

One of Nepal's major assets is water. "Fifteen per cent of the world's hydropower potential is in our country", says Dr Kamal Shreshta, former member-secretary of the Royal Nepal Academy of Science and Technology (RONAST). "But we have not tapped it." He says that if foreign aid were diverted to building hydropower stations, Nepal could become a major exporter of electricity. All of Nepal's motor cars and buses could be run on electricity instead of petrol and diesel fuel, now all of it imported.

In Shreshta's view, the solution for Nepal is a development strategy based on exploitation of local resources using relevant technologies that can be mastered by the Nepalis. "Although we have many foreign-aided projects on energy, nobody bothered to develop a heater based on local fuels for warming homes in winter", says a RONAST scientist. Middle-class homes and government offices of Kathmandu presently burn imported kerosene in a burner marketed by the Japanese at £125 a piece.

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