

OIL RICH, SCIENCE POOR

The wealthy Arab states offer scant support for science and technology.

Jim Giles finds out whether this indifference to research is likely to change.

When *Nature* surveyed the prospects for science in the Arab world in 2002, our reporter picked out three subjects in which the region excelled¹. One was, and still is, important: desalination technologies to combat water shortages. But the other two highlight the region's threadbare research record. Camel reproduction and falconry research might excite Arab sports enthusiasts, but they are unlikely to set the scientific world on fire.

The monarchies of the Gulf are the richest of all Muslim nations, but little of that wealth is spent on research. Saudi Arabia, Qatar and Kuwait spend about 0.2% of their gross domestic product (GDP) on science — less than one-tenth of the developed-country average of 2.3% and about a third of that spent by less wealthy Iran. The oil monarchs have the financial clout to launch major research efforts, but have yet to do so.

"The very rich countries are less concerned because they are sitting pretty on oil reserves," says Nader Fergany, director of the Almishkat Centre for Research in Cairo, an independent social-sciences research organization. "The nature of wealth from natural resources is that it does not require a great level of ingenuity," Fergany notes that even in directly relevant science such as petroleum technology, most innovation happens outside the Gulf.

Oil futures

But some Gulf leaders do see investment in science and technology as a way of creating an economic future when their oil reserves dry up. Among scientists trying to invigorate science in the Gulf, there is a sense that change is possible. "We are now at an inflexion point," says Samir Hamrouni, director of research and development at the Arab Science and Technology Foundation in Sarjah in the United Arab Emirates. "Science is being seen as an alternative to natural resources."

The origins of the current underspend are easy to see. The European colonial powers that ruled much of the Gulf until the middle of the twentieth century invested almost nothing in indigenous higher education or research. Oil revenues transformed the region, but the money kept flowing without the need for major investment in education and science.



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Easy option: the Gulf oil states imported most of the know-how they needed to keep the oil flowing.

The latest statistics collected by COM-STECH, the science and technology committee of the Organization of the Islamic Conference, show little change². The annual output of scientific papers from Saudi Arabia, which generates almost as many papers as the other monarchies combined, was static between 2000 and 2005. Even in desalination technology, investment has been limited. The Middle East Desalination Research Center in Muscat, Oman, set up in 1996 to encourage research cooperation in the region, is currently limping along with a budget of just US\$2 million a year.

The next five years might see more change. In Qatar, the country's head of state, Emir Hamad bin Khalifa Al-Thani, has created an endowment that generates millions of dollars in research funding every year. He has also imported Western science policies, such as competitive grant systems based on external peer review, and is forming partnerships with universities in the United States and Europe³. Environmental science, computing and biomedicine are priorities.

If Qatar's new research centres attract scientists and students, they might prompt its neighbours into action. "Once it develops, other countries will start to think about it," predicts Mohamed Hassan, executive director

of the Academy of Sciences for the Developing World (TWAS), based in Trieste, Italy.

Of those neighbours, Saudi Arabia is making a slow start, having approved a new national science and technology development plan in 2002. Its priorities are defence, and oil and gas technology, but there is also a commitment to devote 1.6% of the nation's GDP to R&D by 2020. Both Saudi Arabia and Kuwait are each investing around \$2 billion in higher-education institutes that include research centres.

Such initiatives generate excitement — and some scepticism. Fergany questions whether the oil monarchies are willing to make the economic and structural changes needed to translate research into innovation. It is also unclear whether the oil-state rulers want to foster the atmosphere of critical enquiry that science needs. Only in the long run, say advocates of reform, will it become clear whether the current commitment is genuine. "Is it just for the moment, or is it really important?" asks Hamrouni. "It depends on our politicians." ■

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1. Masood, E. *Nature* **416**, 120–122 (2002).
2. *Status of Scientific Research in OIC Member States* (eds Naim, S. T. K. & Atta-ur-Rahman) (COMSTECH, 2005); online at www.comstech.org/htm/policy.htm.
3. Giles, J. *Nature* **441**, 132 (2006).

See also Commentaries pages 33 and 35.