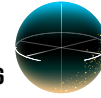


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The Azadi Tower, or Freedom Tower, in Tehran. Researchers in Iran report psychological strain.

POLITICS

How US sanctions are damaging science in Iran

The country is in recession and increasingly isolated — and researchers are suffering.

BY DECLAN BUTLER

US economic and financial sanctions are having a devastating impact on Iran's economy — and its researchers.

After almost a year of sanctions put in place by US President Donald Trump, Iran is experiencing economic recession, a depreciating currency and high inflation. All of this is stretching budgets for equipment, supplies

and travel, endangering research projects and sapping morale, say researchers.

It is now almost impossible to purchase research materials and services from abroad, they add, because the sanctions prevent companies and banks from doing business in Iran.

The country's science minister, Mansour Gholami, told *Nature* that international collaboration has been hit, and some researchers are unable to travel to

scientific conferences abroad. Active research collaborations between the United States and Iran are also on hold.

"The sanctions are affecting health, research and education, things that were not supposed to be their target," says Parham Habibzadeh, a human geneticist at Shiraz University of Medical Sciences in Iran. "Planning a research study in any field of science seems to be almost impossible," he adds. ▶

► Vahid Ahmadi, head of the National Research Institute for Science Policy in Tehran and an adviser to Gholami, criticizes the international scientific community for not acknowledging the plight of researchers.

“Iranian researchers expect their colleagues and scientific societies abroad to be more active in speaking out against the impact of US sanctions on them,” he says.

THE SANCTIONS

The United States has imposed waves of sanctions on Iran since 5 November 2018, months after Trump withdrew from a nuclear deal agreed between Iran and six other world powers. Under this Joint Comprehensive Plan of Action — originally signed by then-US president Barack Obama in July 2015 — Iran agreed to restrictions on its nuclear activities that would have made it impossible for the country to quickly divert its nuclear programme to develop an atomic bomb.

The 2015 deal lifted earlier nuclear-related sanctions put in place by the United Nations, the United States, the European Union and others. “The 2015 agreement was like a new hope,” recalls Mohammad Farhadi, a physician and former president of Tehran University, who was Iran’s science minister from 2014 to 2017.

After withdrawing from the deal, the United States adopted a more aggressive policy to isolate Iran. The Trump administration argues that its predecessor should have held out for more concessions, such as curbs on Iran’s ballistic-missile programme.

The reimposed US sanctions apply to people and organizations worldwide. That includes banks, which are now refusing to process transactions involving Iranian companies and citizens. The international payments-transfer system known as SWIFT disconnected Iran’s banks last year.

“Being unable to do the simplest things like

ordering books online or paying registration fees for conferences should speak volumes about the significance of being cut off from the international financial institutions,” says one academic, who requested anonymity.

A drop in the value of the Iranian rial has also decimated the purchasing power of university budgets. In 2015, 28,000 rials would buy US\$1 at official exchange rates, but that figure is now closer to 42,000 rials to \$1, or 115,000 on the black market. Iran has also experienced inflation of 40.4% over the past year.

LIVELIHOODS AFFECTED

Even basic necessities, including drugs and medical care, have become unaffordable, says former health minister Reza Malekzadeh, a biomedical researcher at Tehran University of Medical Sciences.

The costs of reagents and equipment can be as much as four times what they were before the sanctions, particularly for goods and services purchased abroad, says Ali Gorji, an Iranian neuroscientist based at the University of Münster in Germany who founded the Shefa Neuroscience Research Center in Tehran and the Razavi Neuroscience Research Center in Mashhad. “Many research projects are under real pressure,” he says, especially those with fixed budgets.

That includes a project that Gorji started in 2016 with researchers at the two centres in Iran to develop stem-cell therapies for spinal-cord injuries. The project has run into difficulties because its budget for supplies — 450 million rials this year — is now worth about one-third of its 2016 value. The project is almost a year behind schedule, Gorji says.

COLLABORATIONS ON ICE

The near-collapse of the 2015 nuclear deal has also affected international collaborations between the United States and Iran. Since 2000, the US National Academies of Sciences, Engineering, and Medicine has led a major science-for-peace collaboration with Iranian research groups. Their goal has been to achieve scientific benefits for both sides and to encourage more amiable interactions between the governments.

This project is now on ice partly because of the sanctions, but also because of deteriorating intergovernmental relations. The project’s last engagement was a joint workshop in Italy in 2017, says Glenn Schweitzer, the academies’ director for programmes in central Europe and Eurasia. He says the academies hope to revive the collaboration should relations improve.

Also in 2017, the US treasury department’s Office of Foreign Assets Control blocked five US scientists from attending the tenth International Conference on Magnetic and Superconducting Materials, which was held in Tehran in September.

A month before the conference, the department informed delegates that their participation was “prohibited” but gave no justification, according to two of the invited US delegates — physicists Warren Pickett of the University of California, Davis, and Laura Greene of Florida State University in Tallahassee, who wrote about their experience in *APS News*, the magazine of the American Physical Society. The scientists’ legal counsel could see no reason why conference attendance would violate sanctions, they said. Asked to comment, a treasury spokesperson said the department “generally does not comment on individual licences”.

One bright spot is in high-energy physics, where CERN, Europe’s particle-physics laboratory near Geneva, Switzerland, maintains close links with Iranian scientists, notably those from the Institute for Research in Fundamental Sciences in Tehran, says a CERN spokesperson. They add that Iran is continuing to strengthen its contributions to the laboratory’s experiments.

SALVAGING THE DEAL

All the other world powers that signed the 2015 deal are opposed to the US withdrawal and the subsequent sanctions. The EU has forbidden companies under its jurisdiction from complying with US sanctions, and those that do can face criminal penalties. In a gesture of political goodwill, several EU countries, led by France, Germany and the United Kingdom, are establishing a special payments channel to coordinate barter exchanges with Iran. The aim of this Instrument in Support of Trade Exchanges (INSTEX) is to help companies and Iran to circumvent US sanctions.

Researchers such as Gorji are not optimistic about the potential of INSTEX to ease their predicament. However, French President Emmanuel Macron, its main architect, has said that he is determined to make it work. ■



The value of the Iranian rial has dropped sharply in recent years.

ESSAM AL SUDANI/REUTERS