FUNDING

South Korea's scientists seek change amid political chaos

President's impeachment creates opportunity to shift how nation supports basic research.

BY MARK ZASTROW

When South Korea's Constitutional Court removed scandal-ridden President Park Geun-hye from office on 10 March, citizens rejoiced in the streets — and many scientists breathed a sigh of relief. Her downfall has inspired a public appetite for broad governmental reforms, including changes in how the country supports scientific research. Many in the research community hope to end South Korea's decades-long focus on applied research and shift more resources to basic science.

It is unclear whether, or how, the next administration will change the status quo, but scientists are seizing this opportunity to speak up. "It seems there's a general consensus amongst the candidates that government support of basic science should increase," says Doochul Kim, president of the Institute for Basic Science (IBS), a network of government-funded research centres based in Daejeon.

There is a growing sense that the current focus on applied research is inadequate if the nation is to keep up with scientific advances in the rest of the world. This feeling was reinforced last March when AlphaGo, an artificial intelligence (AI) developed by Google's DeepMind in London, beat Korean grandmaster Lee Sedol at the game of Go. Lee's loss shocked the country, sparking widespread fear that South Korea was losing its technological edge. Park scrambled to respond, calling the development of AI and other 'smart' technologies the "fourth industrial revolution".

She proposed investing US$860 million in AI and opening a new government research centre partnered with corporations including Samsung, LG Electronics, Hyundai Motor and Korean Internet giant Naver. But critics charged that it was a reiteration of the old way of doing things.

Many argued that taking technologies developed elsewhere and improving on them would not be enough to keep South Korean science competitive. "The fourth industrial revolution is based on basic science," says Kim. "Mathematics, algorithms, computer science — it's all basic science."

South Korea ranks near the top of the world in research and development spending by fraction of gross domestic product. Yet since the 1960s, when South Korean dictator Park Chung-hee started investing heavily in applied research, the lion's share of government money has gone to scientific institutes with industry partners. This left academic researchers with a relatively small pool of grant funding (see 'Budget breakdown').

SEONGJOON CHO/BLOOMBERG/GETTY

Technology centres are just one way in which South Korea is trying to expand its basic research portfolio.

"For Park Geun-hye's government, science was just part of making money and growing the economy," says Sang-Mook Lee, a marine geophysicist at Seoul National University. An outspoken critic of the administration, Lee testified before parliament in 2014 at the invitation of the opposition party to advocate for using Korean research ships for basic science rather than searching for deep-sea minerals.

"The fourth industrial revolution is based on basic science."

During the 2012 presidential campaign, Park Geun-hye made science and technology a signature issue. She promised to boost spending on basic science from 35.2% of the government's research budget in 2012 to 40% by 2017. She also pledged to create a science ministry that would build a 'creative economy' of start-ups and transform the country into a technological leader. But in practice, the ministry often supported applied research at government institutes.

A close look at what 'basic research' includes reveals that a lot of the money still goes to what is essentially applied research, says Hyungsub Choi, a historian of science and technology at Seoul National University of Science and Technology.

END OF AN ERA

With Park's removal, some researchers see an opportunity to shift the distribution of funds. "In some sense, President Park's impeachment marks the real end of Korea's developmental decades since the Park Chung-hee era," says So Young Kim, a science and technology political scientist at the Korea Advanced Institute of Science and Technology in Daejeon. But how things will play out politically is not clear.

Park's successor will be chosen in a special election on 9 May. The current front-runner is liberal Moon Jae-in, a former human-rights lawyer and the runner up in the 2012 election. Public opinion polls predict a shift in power, ending nearly a decade of rule by the conservative Liberty Korea Party, formerly the Saenuri party.

The prospects for increased support for basic science are encouraging, says Doochul Kim. Established in 2011, and modelled after Germany's Max Planck Institute and Japan's RIKEN, the IBS is South Korea's flagship effort in basic research.

There are currently 28 research centres within the IBS, but the original plans called for 50. With conservatives now out of favour, the IBS must win multipartisan support to secure its expansion, says So Young Kim.

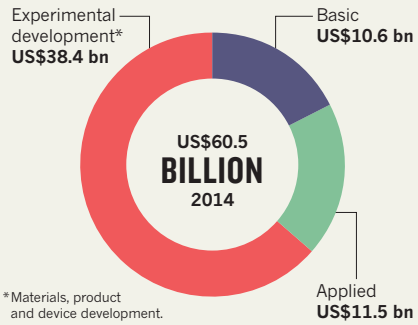
Whatever the future of scientific research looks like in South Korea, it's clear that scientists are trying to change course. Some have taken matters into their own hands: a crowdfunding project to study health issues affecting transgender people in South Korea recently raised nearly 15 million won (US$13,300), exceeding its target by half. Conventional funding routes have proved difficult for research that is not intended for economic growth, says Tae-Woong Yoon, chair of Engineers and Scientists for Change (ESC), and a systems engineer at Korea University in Seoul.

The ESC promotes research for social progress and sustainability, and led the crowdfunding campaign. The group, founded last year, seeks to establish a funding route that is not controlled by companies or political parties, says Yoon.

He is not waiting for the next administration to create change. "I think it's up to us," Yoon says. "We are dedicated and we really want to improve the situation here." ■

BUDGET BREAKDOWN

Basic research got short shrift in South Korea's 2014 science budget, the most recent for which figures are available.



SOURCE: MINISTRY OF SCIENCE, ICT AND FUTURE PLANNING

ETHICS

San people issue research code

Heavily studied indigenous communities — known for their click languages — are the first in Africa to draft science-ethics guidelines.

BY EWEN CALLAWAY

The San people of southern Africa are among the most-studied indigenous groups in the world. Legions of researchers have investigated their hunter-gatherer lifestyles, click languages and ancient rock art, and San individuals were some of the first from Africa to have their whole genomes sequenced.

But some San want a greater say in such research. On 2 March, three communities in South Africa issued their own research-ethics code — thought to be the first from any indigenous group in Africa. Although the rules will carry no legal weight, their authors hope that scientists will feel compelled to submit proposals for research in San communities to a review panel of community members. And the San may refuse to collaborate with institutions whose staff do not comply, the rules warn.

The code was developed by traditional leaders of the !Xun, Khwe and !Khomani groups of San, which represent around 8,000 people in South Africa.

"We've been bombarded by researchers over the years," says Hennie Swart, director of the South African San Institute in Kimberley, which helped to develop the code. "It's not a question of not doing the research. It's a question of doing it right."

The impetus for the ethics code was the 2010 publication, in *Nature*[1], of the first human genome sequences from southern Africa: those of Archbishop Desmond Tutu, winner of the 1984 Nobel Peace Prize, and four San men from Namibia. The Namibian government and ethics committees at the scientists' universities in Australia, South Africa and the United States approved the study. The researchers also filmed the San men giving verbal consent with the help of a translator.

OLEKSANDR RUPETA/NURPHOTO VIA GETTY

A traditional San dance performed at a living museum in Namibia.

But some San leaders were upset that the team did not consult them, and were concerned about how the researchers obtained informed consent from the San men, according to Roger Chennells, a human-rights lawyer based in Stellenbosch, South Africa, who helped draft the code (see go.nature.com/2nwyj1m). The study was a "massive catalyst", he says.

The paper also used terms, including "Bushman", that some San individuals consider offensive. "No other recent research has been perceived as being so insulting and arrogant to San leaders," says Chennells.

He anticipates that communities in Namibia and Botswana will formally adopt the code in the future. Until then, researchers working with those communities will be encouraged to take note of the code, adds Chennells.

However, Stephan Schuster, a genome scientist who co-led the study while at Pennsylvania State University in State College, asks whether the views of San leaders in South Africa are representative of other San groups. "Why would a San council in South Africa know what we are doing in northern Namibia?" ▶