

# CHINA'S BRIDGE TO AFRICA

*Africa has emerged as a major partner in China's Belt and Road Initiative, and that is paying dividends for science on the continent.*

BY ANTOANETA ROUSSI

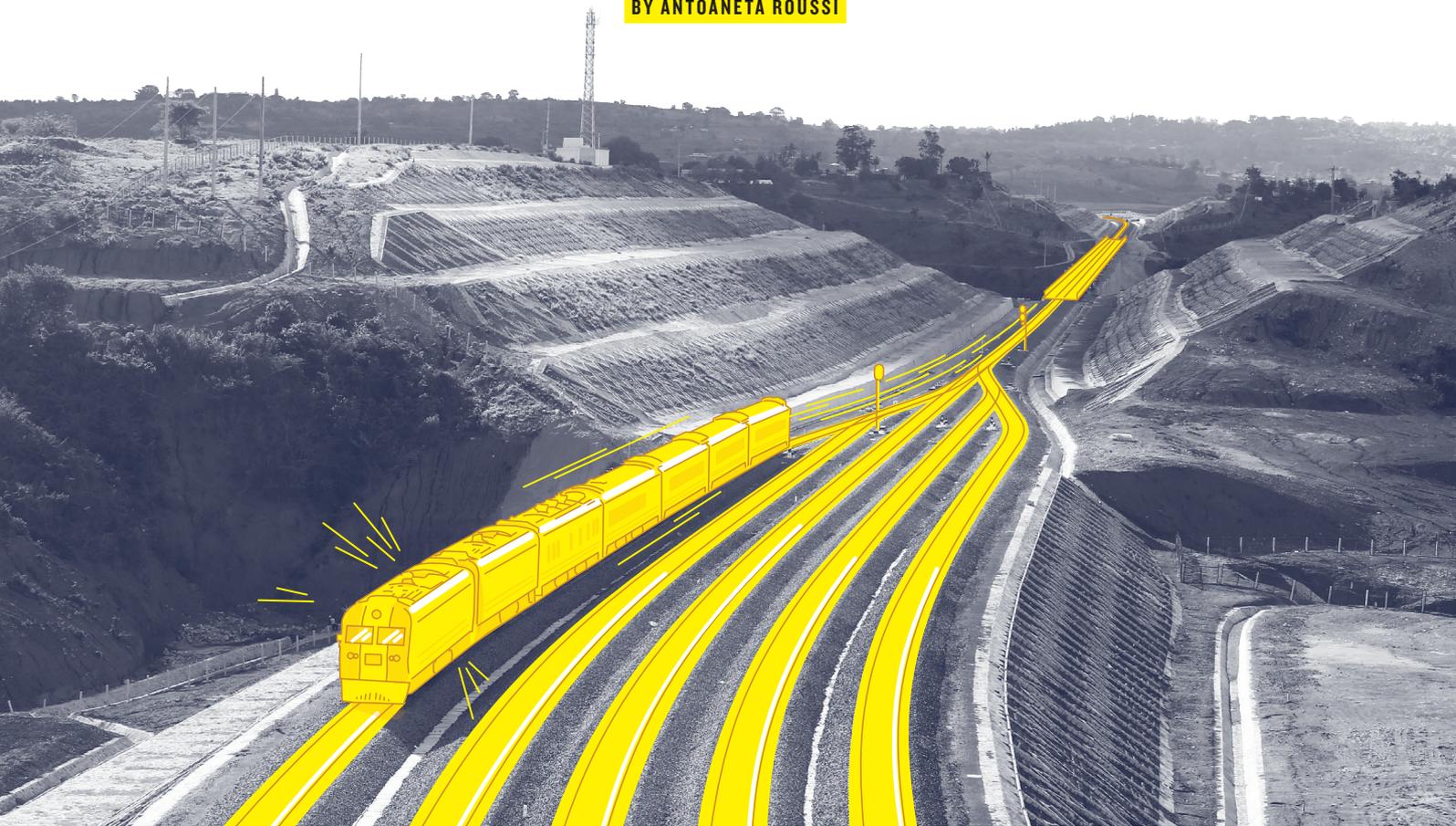


IMAGE FROM PAN SIWEI/XINHUA/ADAALAMY;  
ADAPTED BY JASIEK KRZYSZTOPIAK

Inside a greenhouse on the edge of Nairobi, a small crate holds the hopes of Robert Gituru and a team of researchers from Kenya and China. It is filled with healthy bunches of red and green grapes — some of the first ever produced in central Africa.

The grapes are varieties developed by the Chinese Academy of Sciences (CAS) and designed to thrive in warm, semi-arid environments. A joint Kenyan–Chinese team has been growing them with the aim of planting the seeds of a wine-producing industry in Kenya.

“It’s got some people here very excited,” says Gituru, director of the Sino-Africa Joint Research Centre, a facility established with the help of CAS that opened last November in the grounds of the Jomo Kenyatta University of Agriculture and Technology.

Grapes aren’t the only crop that the centre has received from CAS; the academy has also brought strains of rice that have the potential to increase Kenya’s production by more than one-third, according to Gituru. Chinese researchers have also introduced a method of using plastic sheets to preserve soil humidity for fields planted with maize (corn).

For Kenya, the results of these experiments could have some big

impacts: like many parts of Africa, the country faces perennial food shortages. “The next step is to try these on a large scale,” says Gituru.

China’s presence in Africa has been increasing for two decades, but it started to accelerate in 2013, when President Xi Jinping launched his ambitious infrastructure-development project, now known as the Belt and Road Initiative (BRI). That venture, often estimated to cost more than US\$1 trillion, aims to connect China with more than 130 nations through roads, railways and marine links to increase trade and China’s influence in the world.

So far, 39 African countries and the African Union Commission have signed BRI cooperation agreements, with others expected to follow. Africa has emerged as one of the strongest supporters of the BRI, with most of the continent having joined the programme; and China has become the largest financier of African infrastructure, funding one in five projects. As in many other regions participating in the BRI, this has implications for science and education.

**The Mombasa–Nairobi railway was financed largely by money loaned by China.**

Although imagined before the BRI, the Sino-Africa centre has become a crucial part of the project's scientific investments on the continent. As the first research centre between the CAS and an African country, it will form the headquarters for a handful of similar institutions sprouting up across the continent, from Madagascar to Guinea. Plans call for these centres to explore flora, fauna and biodiversity protection.

China's assistance is also reflected in education there, particularly in the sciences. China hosted nearly 62,000 African university and postgraduate students in 2016, second only to France at 103,000, according to the most recent figures available from the Chinese Ministry of Education and the United Nations Educational, Scientific and Cultural Organization. The Chinese government also offered 8,470 scholarships to African students in 2015, says Rui Yang, associate dean of international education at the University of Hong Kong.

China's support for African postgraduate and postdoctoral students is unprecedented, says Mohamed Hassan, president of the World Academy of Sciences (TWAS) in Trieste, Italy, and a Sudanese mathematician.

"When it comes to training a new generation of African scholars, [the Chinese] are doing a marvellous job," Hassan told *Nature*. "They are doing better than any other country for Africa."

## OPEN ARMS

From oil pipelines in Sudan to railways in the Horn of Africa and fishing fleets in Ghana, China's influence is evident everywhere in Africa. In return, Africa is eagerly embracing the expertise and easy-to-access loans as it faces a swelling population — expected to double by 2050.

Zeng Aiping, deputy executive director of the China-Asian African Cooperation Centre in Beijing, says that Africa is "the natural partner" of the BRI, which is, at its core, a development enterprise.

"More and more African countries have recognized the importance and significance of the BRI for African development," he says.

Western critics say that China's activities in Africa are saddling countries with more debt that they can ever repay, while carting away minerals and other resources. But supporters say that China has brought expertise on important development issues and has a much better sense than Western nations of the challenges involved in raising standards of living.

In the arena of research and development, China has concentrated on three main areas in Africa: information technology, agriculture and education. These are all key goals for development, and they are sectors in which China would like to increase trade or where it sees benefits for its own companies.

On the technological front, China is unmatched in Africa. The country's telecommunications giant Huawei has built half of the 4G networks on the continent and most of the 2G and 3G; two of the three most popular smartphone brands are Chinese.

By stocking up the continent with its 5G standard, China hopes to secure a market of 2 billion people for the next generation of the Internet, which will service everything from smart homes to health care.

One of the most ambitious digital projects of the BRI is the PEACE cable — a fibre network that connects Asia to Africa and then on to Europe at speeds of 16 terabytes per second. According to Huawei, which is constructing the line, any telecommunications company will be able to use the cable to boost their own local network service.

Whereas some US and European officials have been concerned about Huawei's activities, such worries have generally been overlooked in Africa in the great need to get online. "You can see why when the US said 'don't work with Huawei,' the Africans looked and shrugged and said 'Yeah, that's not going to happen,'" says Eric Olander, co-founder of the China Africa Project, a non-profit and independent multimedia resource in Shanghai.

Chinese artificial-intelligence (AI) companies are also making a major push into Africa. And because Africa's data-privacy laws are looser than those in Europe and some other regions, AI firms are able

to take advantage of surveillance technologies there. The Chinese company Cloudwalk, for instance, has signed a cooperation agreement with Zimbabwe's government for a mass facial-recognition project. The initiative aims to improve the ability of AI algorithms to detect faces with dark complexions, a challenge faced by many systems. In return, Cloudwalk will help the government to build a smart banking system to integrate finance with technology, and to improve surveillance technology at airports, railway and bus stations, according to the Chinese media site Global Times.

In agriculture, China is facing a similar problem to many African countries: how to supply a growing demand for food in the face of extensive desertification. "China has a lot of expertise in desert management with the Gobi Desert expanding," says Olander. "This isn't necessarily an expertise that Europeans or Americans specialize in."

China has also been focusing on higher education in Africa. The Chinese Language Council, or Hanban, has established 59 Confucius Institutes there to spread the teaching of Chinese language and culture. China ranks highly in the number of cultural institutions it has in Africa — second only to France, which has 115 institutes. And several African countries, including South Africa, Uganda and Kenya have started to add Mandarin to secondary-school programmes.

Researchers say that many African countries would not be able to achieve as much as they do in science and technology without help from China. That's clear in the continent's space race. China's space agency is providing \$6 million to help Ethiopia launch its first satellite later this year, which will provide scientific data on climate and weather-related phenomena.

"Africa is a rising star, but the Chinese have been a helping hand, and are helping us get to where we'd like to be, sooner," says Gituru.

African nations are less fearful of brain drain to China than to the Western institutions that often recruit the best minds. That's less of a problem with China, because its tight visa controls mean that foreign students must return home once they finish their programmes.

Although Chinese institutions are not committed to continue supporting African scientists once they leave, alumni often maintain links with Chinese peers throughout their career and jointly pursue research funds, says Hassan. TWAS reports that most African students who go to study in China through a fellowship report a positive experience. Many also obtain positions at African institutions after they return.

Emmanuel Unuabonah, who works on applied materials science at Redeemer's University in Nigeria, says that he didn't even have to wait until he had defended his doctoral thesis after returning from China before he got a job.

"With the dearth of qualified scientific personnel in Africa, there are positions for scientists who have been trained outside the continent in reputable institutions," says Unuabonah.

This was also the case for Gituru, who completed his entire higher education in China. After several years as a professor at Jomo Kenyatta, he was able to convince the university administration to set up the Sino-Africa Joint Research Centre in association with CAS's Wuhan Botanical Garden.

According to Gituru, the Chinese government contributed \$15 million towards the construction, and CAS has since provided a further \$3 million for equipment. The Kenyan government supplied the land at no cost, and waived all duty taxes on imports.

Some Westerners have questioned the motives behind such investments, but Gituru, who proudly displays a photograph of the Chinese revolutionary Mao Zedong on his desk, says that any responsible power has the duty to provide help, especially scientific support, not just to its people but to the global community.

"Global challenges — those that face humankind," he says, "really have no boundaries." ■

*Antoaneta Roussi is a freelance journalist in Nairobi.*

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