



Experts examine options for mobilizing diaspora scientists

Symposium: Diaspora scientists: Canada's untapped resource of global knowledge networks

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Panelists: **Rahim Rezaie**, Research Associate, Centre for Global Engineering, University of Toronto; **Valerie La Traverse**, Deputy Director, Policy Research and Outreach, Global Affairs Canada. **Farid Bensebaa**, Senior Research Officer / Adjunct Professor, National Research Council of Canada / York University; **Elian Carsenat**, President, NamSor Applied Onomastics; **Jeongdong Choe**, Ottawa chapter head, Association of Korean-Canadian Scientists and Engineers (AKCSE), Senior Technical Fellow, Techinsights; **Daryl Copeland**, Senior Fellow, Canadian Global Affairs Institute/University of Montreal's Centre for International Studies and Research; **Govinda Dahal**, Senior Researcher, Faculty of Medicine, University of Ottawa; Mehrdad Hariri, President and CEO, Canadian Science Policy Centre; **Chris Mayaki**, Director, Special Duties and Leads Programme, National Universities Commission, Nigeria; **Sujata Ramachandran**, Research Associate, Queen's University, Southern African Research Centre; **Girish Shah**, Professor, Faculty of Medicine, Laval University; **Ken Simiyu**, Program Officer, Grand Challenges Canada; **Halla Thorsteinsdottir**, Director / Adjunct Professor, Small Globe Inc. and Institute of Health Policy, Management and Evaluation, University of Toronto; **Margaret Walton-Roberts**, Associate Dean, School of International Policy and Governance, Balsillie School of International Affairs

Takeaways and recommendations

- ✓ Government is best positioned to be a collaborator/facilitator.
- ✓ There is often difficulty determining who the appropriate government scientists/contacts are that the community should be reaching out to.
- ✓ Identify the membership, institutional affiliations and specialists of existing diaspora science communities (DSCs)
- ✓ There are no existing platforms where diaspora scientists can come together. (e.g. a database of DSCs in Canada and Canadian DSCs abroad)
- ✓ Individual culture is important, but also infrastructure (e.g. funding frameworks)
- ✓ Linking and leveraging the diaspora would be a good way to advance development objectives.
- ✓ Work with Government of Canada to skill-up Canada's foreign service in science diplomacy and management of international S&T issues.
- ✓ Engage with more than just the usual suspects. Business councils have already established connections that could be leveraged.
- ✓ There needs to be a strong value proposition when asking people to join any diaspora network.
- ✓ There are large Canadian diasporas in places like Hong Kong as well as many Canadian scientific entrepreneurs in Boston and the SF Bay Area that can be tapped into.
- ✓ Conduct further research on the current status of DSCs at home and abroad, existing programs that support DSCs and potential policy options.

The policy issue: Canada is one of the most diverse and pluralistic countries on the planet, but it needs better policies, national coordination and long-term funding to mobilize and connect new Canadians, particularly those involved in science, engineering, medicine and education. Compared to other countries, Canada also lags when it comes to engaging Canadian researchers working abroad.

The CSPC brought together more than a dozen experts to share their ideas and experiences with scientific diaspora communities (DSCs), which represent a significant untapped opportunity to strengthen Canada's global connections in science, innovation and trade.

According to Copeland, the essential question is: "Can the collective knowledge, expertise, cultural understanding, and linguistic capacities of DSCs, or networks, be harnessed to produce win/win diplomatic and international policy outcomes for both home and host governments?"

The former diplomat stressed there are no military solutions to the world's most urgent issues, such as global warming, ecosystem collapse, pandemic disease and public health. He described these as "wicked" issues that are cross-sectoral, unresolved, transnational and science-based.

Even on the issue of terrorism and other conflicts, he described the world's traditional reliance on hard power, coercion and military responses as "old think". "I think that science offers a better route to security because science offers the prospect of successfully addressing problems of underdevelopment – a major contributor to insecurity."

"You can't call in an airstrike on a warming planet. You can't send out an expeditionary force to combat a carbon economy. Science diplomacy is an area where we're really going to have to up our game radically if going to have a reasonable prospect of addressing these challenges which are immune to armed force," said Copeland.

The policy options: Several countries have made great strides in identifying and supporting DSCs. Copeland described the United States as the "best practices leader" on this issue. In 2012, the U.S. government and main scientific bodies launched the Network of Diasporas in Engineering and Science (NODES), which supports science diaspora networks. The government also hosts an annual Global Diaspora Week, which in 2015 featured 90 events from 22 countries. No such equivalents exist in Canada.

What's needed here, said Copeland, is "radically reformed diplomacy" with DSCs playing a critical role. "But that will require resources and investment. We are behind the eight ball."

It will also require better data on the current state of scientific diasporas and the policies and funding mechanisms that support them. Little research has been done to identify Canadian scientists working abroad or foreign-born scientists working here and how these networks could contribute to diplomacy, development and international policy. Research to date suggests Canada's has a sizeable DSC but few formal mechanisms to encourage collaboration with their home countries.

Big data tools like NamSor could help address this information gap. Launched by Carsenant, a data scientist based in Paris, this name recognition software can identify the linguistic or cultural origins of names in any alphabet or language. For example, it found that most cancer researchers from Poland and Slovenia are now working in the U.S., U.K. and Germany. NamSor uncovered the percentage of Chinese, Indian, Iranian, Moroccan and Italian scholars working at several Canadian universities. NamSor also showed that strong diaspora linkages improve an institution's academic ranking and a scholar's impact factor.

DSCs fuel international collaboration

International scientific collaboration, particularly interdisciplinary team-based research, is becoming more prevalent. Thorsteinsdottir noted that internationally co-authored papers grew from 14% of all publications in the Institute for Scientific Information index in 2000 to 18% in 2009 (Gazni et al, 2012).

DSCs are key players in these collaborations. A 2015 study by Scellato et al showed that both foreign-born scientists and scientists returning to their home countries from abroad are more likely to collaborate internationally. However, despite having the second largest scientific diaspora among 15 major economies, the study showed Canada ranking third from the bottom in terms of researchers' collaboration with their home country.

Some DSCs in Canada are more active collaborators than others, notably the Chinese diaspora. Also research on Canada's health biotechnology collaboration shows considerable collaboration involving scientists from Brazil, China and India. Thorsteinsdottir further highlighted that the International Research Chairs Initiative, supported jointly by the International Development Research Centre (IDRC) and the Canada Research Chairs Program, involves the scientific diaspora as principal investigators frequently, or in five out of nine supported projects.

In terms of policy options, Thorsteinsdottir said more research is needed. For example, should Canada set up programs that support research collaboration involving diaspora scientists or take a less targeted approach that funds international collaborations more broadly?

La Traverse said Canada should consider engagement strategies that bring these different communities together to create a pluralistic DSC network, rather than approaches that focus primarily on bilateral collaborations. "At the end of the day, we have to think about collaboration not just for collaboration's sake. We want to ensure the collaborations lead to good research that leads to relevant knowledge or innovation."

DSCs and developing countries

Grand Challenges Canada: Funded by the Government of Canada, GCC is dedicated to supporting "bold ideas with impact" in global health. It funds innovators from low and middle income countries and Canada and encourages scalable research, sustainability, economic impact and "integrated innovation" (scientific, technological, social and business).

Canadian applicants must have a developing country partner, which Simiyu said gives diaspora scientists an advantage. "They already have networks and are more likely to apply and be (funding) recipients," he said.

Projects that pass the proof-of-concept stage receive larger grants to scale up the research results. The innovation is then handed off to the private sector as a revenue-generating enterprise or to domestic governments committed to continue the activity.

Simiyu said GCC is an effective mechanism for diaspora scientists to collaborate with researchers in their home country, noting that projects led by diaspora scientists are more likely to transition to phase two "because they are better able to establish linkages (with their home country) faster".

India: Developing countries are looking for more ways to exploit the potential of their scientific diasporas. Research led by Walton-Roberts has examined diaspora-led investments in skills development and training in India's healthcare sector. She found that the government's development and education priorities don't always align with a physician's personal or career motivations. For example, many returning doctors set up private practices, "which contributes to ongoing privatization ... it's not necessarily helping the poorest in the country".

Canada's Indian DSC has a strong history of collaboration with their home country in arts, literature and social sciences, noted Shah. More opportunities are opening up in medicine (e.g. diabetes) and engineering (e.g. Clean Ganga projects, bridges, clean drinking water, solar technology), but funding is needed. "Many researchers don't even bother looking because there's no enough funding available," he said.

One promising model is the Shastri Indo-Canadian Institute, the only binational institute supporting higher education collaboration between India and Canada. Founded in 1968, the institute has grown from three to 90 members, including 36 Canadian cities and 54 Indian cities. Building on this success, Shah encouraged DSCs to exchange ideas and suggest programs and policies that would promote more scientific exchanges.

South Africa: A study of the South African SDC in Canada, led by Ramachandran, found that first-generation immigrants, particularly those who came to Canada during apartheid (pre-1990), were highly engaged in fundraising or education-based activities that benefited their home country. As examples, she pointed to University of British Columbia geneticist Dr. Michael Hayden who donated \$500,000 from a health research prize to a charity that trains aspiring doctors and researchers, particularly those from Africa. Another South African native, Dr. Neil Turok, championed a fundraising effort to launch the African Institute for Mathematical Science and its Next Einstein Initiative.

But Ramachandran found that connection with an ancestral country wanes with each subsequent generation. “With the post-1990 arrivals being far less involved in such projects, the long-term prospects of such engagement and replaceability to sustain the momentum of existing initiatives or groups remains a fundamental challenge for this particular diaspora,” she said.

The story was similar for Indian researchers working in Canada. Shah noted that first generation diaspora scientists are the most interested in collaborating with India, but are the least equipped in the beginning to capitalize on this advantage. As with South Africans, that interest begins to drop off with second generation diaspora.

Nepal: Dahal highlighted several DSC initiatives and groups that are promoting skills development and connecting institutions in Canada and Nepal. They include the Canada Foundation for Nepal (CFFN), the Open University Nepal Initiative (OUNI), Non-residence Nepali Association (NRNA) and the Nepal Science Foundation Trust (NSFT).

For example, a 2014 workshop supported by the Canadian Institutes of Health Research brought together Nepali diaspora scientists from Canada and institutions from Nepal to share scientific knowledge and catalyze activities related to nutrition and public health.

CFFN has applied for an IDRC grant in the area of food security, in collaboration with Agriculture and Agri-food Canada, International Union for Conservation of Nature (Kathmandu), and Kathmandu University. The proposal brings together more than 50 scientists from Canada, the U.S., U.K., Australia, Switzerland and Nepal.

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While there have been successes, Dahal suggested “suitable policies” are needed to better exploit the untapped potential of DSCs.

South Korea: The Korean DSC in Canada is relatively small, about 2%, but Choe said there are significant opportunities for bilateral collaboration, particularly following the 2014 Canada-Korea Free Trade Agreement and a 2015 agreement to establish a formal framework for science, technology and innovation collaboration between Canada and South Korea.

Choe said those opportunities include interchanges with other diaspora communities and joint conferences with other associations (e.g. aerospace and semi-conductor). One successful model he identified is the Association of Korean Canadian Scientists and Engineers. Established in 1986, the AKCSE promotes bilateral collaboration in areas such as aerospace, mechanical engineering, chemical engineering and natural resources. Nearly 2500 members, including over 1000 students have joined provincial chapters across Canada.

Such conferences and symposiums are common in the U.S., but less so in Canada. Part of the problem, said Choe, is finding the right person to talk to in the Canadian government.

“Every time I ask other Canadians what kind of division in government I should approach to discuss this kind of policy, the answer is always, ‘I don’t know’. Hopefully this will change with the new government.”

North Africa: The biggest challenges facing stronger ties between the Canadian DSC and their home countries in Africa is a lack of critical mass (people) and ongoing funding to sustain networks, said Bensebaa. Examples of groups that are no longer active include the BioAlliance Canada-Maroc (Morocco) and the Algeria-Quebec Research and Cooperation University Center (PURAQ) Canada.

Bensebaa stressed that “big challenges require resources” and that scientific diaspora could play a critical role to identify challenges and sustainable solutions that provide opportunities for remote communities (in North Africa and northern Canada), support affordable and quality education and increase critical mass and connectivity.

In 2009, Bensebaa, who emigrated from Algeria, founded the Leaders and Experts for Cooperation and Development (LECODEV), a Canadian non-profit that links Algeria’s business and scientific communities to promote training and research for socio-economic development. He said it would be worthwhile holding science-related events led by more than one existing diaspora.

Nigeria: In 2007, Nigeria’s National Universities Commission launched the Linkages with Experts and Academics in the Diaspora Scheme (LEADS) program to strengthen engagement with its diaspora in the fields of engineering, mathematics, biochemistry and

education. Successful applicants from the diaspora receive a monthly stipend and expenses to work as visiting lecturers, professors or researchers. Of the 62 LEADS scholars, only a handful are from Canada.

"We are hoping to engage the new (Canadian) government to increase this ... we need those discussions at the highest level," said Okojie.

Examples of DSC networks

United States:

- Network of Diasporas in Engineering and Science (NODES) – joint venture involving the State Department, the American Association for the Advancement of Science, the National Academy of Sciences and the National Academy of Engineering
- International Diaspora Engagement Alliance (IDEA) – public-private partnership sponsored by the State department, AID, and the Calvert Foundation.

Europe

- European Scientific Diasporas in North America (EURAXESS) – provides information on research positions, fellowships and funding sources in member states

Asia

- Global Indian Network of Knowledge (Global INK) – an electronic platform for knowledge exchange between the diaspora and India