Scientific diasporas as an option for brain drain: re-circulating knowledge for development

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Abstract: Emigration of highly skilled workers from the global South to the global North or brain drain is a major contributing factor to the increased economic and social disparities in the developing world. The role of skilled immigrants or diasporas in contributing to technological developments in their country of origin is still poorly understood and is particularly interesting given the importance of Science and Technology (S&T) in improving the human condition and economic development. This paper will highlight the role of scientific diasporas as significant partners in development cooperation. We begin by reviewing diasporas as a source of capital for development. We briefly examine a case where skilled diasporas played a role in the technological and economic development of their home country and emphasise the empirical gaps in knowledge on how to harness S&T diasporas’ potential. In the last section of this paper, we discuss policy prescriptions for turning brain drain into brain circulation. As developed countries benefit from the brain drain, we suggest they have a responsibility to foster international partnerships between developing countries and their skilled diasporas and that developed countries should make the diaspora option an integral part of their international development policy.

Keywords: brain drain; brain strain; brain circulation; scientific diasporas; Diaspora Knowledge Networks (DKNs); developing countries; Science and Technology (S&T) for development; knowledge transfer.


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1 Introduction

Over the last two decades, increased international migration has renewed concerns of the ‘brain drain’. Emigration of highly skilled workers, defined as having completed tertiary education (Lowell, 2001b), from the global South to the global North is a major contributing factor to increased economic and social disparities in the developing world (Solimano, 2001) and leaves in its wake financial, technological and knowledge gaps (Lowell, 2001b). Skilled immigrants play a significant role in fostering Science and Technology (S&T)-driven innovation and economic progress in developed countries (Saxenian, 1998,1999b). However, the role of such immigrants in contributing to technological developments in their country of origin is still poorly understood and is particularly interesting given the role that S&T plays as a tool to improve the human condition (UNDP, 2001) and in economic development (Daar et al., 2003; Juma and Yee-Cheong, 2005a,b; UNDP, 2001). We suggest that skilled immigrants or ‘diasporas’ could contribute to their countries of origin if their needs were better understood and governments implemented appropriate policies to encourage diasporas’ efforts systematically.¹

The goal of this paper is to highlight the role of scientific diasporas as significant partners in development cooperation. We begin this paper by reviewing diasporas as a source of capital for development. We briefly examine a case where skilled diasporas played a role in the technological and economic development of a home country and emphasise the empirical gaps in knowledge on how to harness S&T diasporas’ potential. In the last section of this paper, we discuss policy prescriptions for turning brain drain into brain circulation. As developed countries benefit from the brain drain, we suggest that they have a responsibility to foster international partnerships between developing countries and their skilled diasporas and that developed countries should make the diaspora option an integral part of their international development policy.
2 Skilled diasporas: background

Derived from the Greek, ‘diaspora’ is defined as ‘the breaking up and scattering of a people’ or those ‘settled far from their ancestral homelands’. Words such as ‘citizens of national origin’, ‘non-residents’, ‘second generation’ and ‘labour migrants’ are sometimes used synonymously with the term diaspora (Ionescu, 2005). However, the recent advent of the terms ‘S&T diasporas’, ‘intellectual diaspora’ or ‘knowledge diaspora’ are often subject to ambiguous interpretation. In recent literature, the term ‘scientific diasporas’ was defined as a “self-organized community of expatriate scientists and engineers working to develop their home country or region, mainly in science, technology, and education” (Barre et al., 2003). However, the evolution of the word and the multiple frameworks in which it is used has made defining it in the present context a challenge given that many countries have differing understandings and interpretations of its meaning. The lack of a consensus surrounding the definition of ‘diaspora’ and the way in which to best utilise it, still presents a challenge to policy makers. The semantic debate surrounding the term ‘diaspora’, however, does not negate the fact that the growing S&T divide creates a need to explore the transnationalisation of immigrant scientists and entrepreneurs living in developed countries as a concrete policy option.

The brain drain from developing countries, especially in the science and health sectors, has been highlighted by the international community as a significant problem. Our purpose in this paper is neither to endorse nor discourage emigration from developing countries. Rather, we explore the options needed to ensure that developing countries harness their skilled diasporas, who represent a precious commodity. One conception is to view skilled diasporas as part of a ‘World City’ where the economy is “oblivious to national or political boundaries” (Friedmann, 1986). Friedmann’s ‘World City Hypothesis’ suggests “a new view of the world as a system of evolving ‘networks’ with various ‘nodes’ organising multiple types of global flows, including the flow of persons” (Friedmann, 1986; Koenig, 2004). The international flow of persons shifts how populations are able to work in a World/Global City (Sassen, 1991) and helps us to move away from the unidirectional view of the ‘brain drain’ towards the notion of ‘brain circulation’, which better represents the increasing mobility of highly skilled workers (Gaillard, 1997,1998). Promoting the recirculation of brains or “the re-supply of highly educated populations to the sending country” (Lowell, 2001b) does not have to be achieved through the permanent return or the physical presence of expatriates. Knowledge circulation can be increased by ensuring that diaspora policies, both in developing and developed countries, act in concert with each other to harness the tremendous capital that skilled diasporas represent for international development.

2.1 Diasporas as source of capital

When examining the role of diasporas in development, studies have largely focused on their financial potential; diasporas’ financial remittance flows from developed to developing countries and their role in economic development have been a highly active and debated area of research. The total value of official remittance transfers flowing into developing countries is estimated at over US $200 billion (Hussain, 2005), and thus remittances cannot be ignored as a potential source of economic development for these countries. On one hand, remittances have been cited as having positive effects on development at the micro-economic level. They stabilise sources of foreign exchange, act
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as a potential source of savings and investment for capital formation, facilitate children’s education, raise the standard of living of recipients by providing them the means to increase their levels of consumption, reduce income inequality and help to reduce poverty (Russell, 1986). However, the issues of moral hazard such as cultural dependency, resulting in a reduction of labour efforts (Solimano, 2003) and a decreased incentive for governments to make policy changes to retain their skilled workers (Wucker, 2004) are also associated with remittances. Therefore, some empirical estimation suggests remittances have an overall negative effect on economic development (Chami et al., 2003). Moreover, remittances are thought to have life cycles characterised by an inverse relationship to the number of years the migrant lives abroad leading some authors to caution policy planning around remittances (Ramamurthy, 2003). Thus, the true developmental impact of remittances still remains unclear and more detailed case studies on their impact need to be carried out (Commander et al., 2003).

While policy research on the impact and usage of remittances for development is ongoing, it is probable that the migration of workers from developing to developed countries cannot be fully compensated by remittances (Rapoport, 2005). It has also been suggested that education reduces the likelihood that a worker will remit1 (Ratha, 2003). This point is especially relevant given that the studies have shown that only 19% of the workers earning more than $50,000/annum send remittances (Suro, 2003). It is not unreasonable to assume these two categories of migrants belong to the same group, that is, migrants who are highly educated are also earning more than $50,000 per year. Therefore, the potential of highly skilled diaspora is not being harnessed through remittances.

3 Can skilled diasporas have impact on development?

3.1 Case studies

Advances in telecommunications combined with diminishing air travel costs have provided highly skilled workers the opportunity to become transnational citizens by allowing them to connect and contribute to businesses and academic centres throughout the world.1 One of the most studied examples in which transnational communities have had a strong impact on the development of their home country is found in the Asian-American networks linking the Silicon Valley with the Hsinchu region of Taiwan.6,7 Saxenian’s study of this transnational community was seminal in showing that a large part of the success of Taiwan’s information technology sector development in the 1980s and 1990s was due to Asian-American engineers who built social and economic bridges linking the economies of the Silicon Valley and Hsinchu Park. This skilled immigrant community originated from a brain drain of Taiwanese engineering students seeking graduate training in the USA. A specific set of circumstances allowed them to contribute back to their home country, including:

1 the explosive growth of a new technology sector in Silicon Valley that harnessed their skills
2 the formation of professional associations which provided role models and assisted in the advancement of individuals within the community as a result of a sense of personal and professional exclusion within Silicon Valley
3 a high spirit of entrepreneurship within this community and
4 an active initiative by the Taiwanese government to promote the information technology sector and a proactive engagement of its overseas engineers in developing strategies to promote private sector growth in the Hsinchu region (Saxenian, 1999a).

The experience of the Silicon Valley transnational communities is now well documented, but unfortunately there have not been similar in-depth case studies of other multiethnic S&T clusters in the world from which to draw comparisons. Moreover, the Silicon Valley experience remains largely an Information and Communication Technology-(ICT-) based experience and thus, may not lend itself to generalisations.

There also exist examples outside ICT that highlight the capacity for diasporas to contribute to their home countries. Davone has reported that the Indian-American community plays a role in the improvement of Indian hospitals through sabbatical residencies. Other approaches used by skilled diasporas in the transmission of information include organising annual seminars in collaboration with home country counterpart organisations, providing consultative services to the home country government (Abdelgafar et al., 2004; Lucas, 2001), providing technology know-how through license agreements, assuming top managerial positions in their home country (Zhenzhen et al., 2004), mentoring startup managers and providing angel investments by experienced entrepreneurs (Devesh, 2001) and the development of diaspora business networks (Newland, 2004).

The emergence of scientific Diaspora Knowledge Networks (DKNs) was described in 1997 by Meyer. In that study, the authors described the Colombian Red Caldas network, one of the first networks to have emerged as an autonomously organised group of expatriate scientists (Meyer et al., 1997). Red Caldas' mandate is to build the Colombian S&T communities and link them to international S&T communities through professional contacts, conferences, seminars and other knowledge-sharing strategies (Chaparro, 2004; Meyer et al., 1997). Since then, Meyer and Brown have reported the existence of 41 expatriate organisations with the internet sites meant as channels for the diaspora to identify and engage in development of their home country (Brown, 2000; Meyer and Brown, 1999; Vertovec, 2002). Moreover, in their in-depth survey published in 2003, Barre et al. concluded that

"the large and increasing number of highly skilled migrants, their tendency to organize spontaneously, and the development of ICT combine to produce a situation conducive to the formation of S&T diasporas" (Barre et al., 2003).

The ability of individuals and groups to connect globally with each other using the internet has increased interest and opportunities for expatriate scientists from ‘the South’ to develop professional linkages with their country of origin (Meyer and Brown, 1999; Meyer et al., 1997). DKNs are now a key tool needed to engage diaspora members located throughout the globe and an e-presence is probably integral to the success of a diaspora network in much the same way as it would be integral to the success of any organisation that is trying to reach out to a globally dispersed market. However, challenges persist. Despite the presence of hundreds of these networks, international policy makers agree that few longitudinal studies have been done examining their impact, longevity and viability (Barre et al., 2003; Ionescu, 2005; Lowell, 2004a,b).
3.2 The empirical data gap on how best to engage S&T diasporas for development

The emergence of DKNs has been a grassroots phenomenon and it is currently unclear how these initiatives are actualised from a concept into being. A lack of diaspora policy may be one of several hurdles DKNs face. Growing organically out of a desire to help citizens of their home country, networks risk failure without sufficient funds and governance.¹¹ Transferring knowledge, creating partnerships and dealing with bureaucracy requires resources. A lack of resources may not only inhibit the growth of an organisation but may contribute to the erosion of members’ morale and the ultimate failure of a network. Empirical questions remain. Can a network flourish under a dismissive or even hostile government? And does having government support necessarily mean that a network will thrive and have the ability to carry out its objectives?

There is a gap of concrete knowledge regarding experiences in contributing to innovation and development (skills, networking, training, management and/or investment) to developing countries and factors that facilitate or impede such intellectual remittances. For example, Lowell and Gerova (Lowell, 2004b) reported 20 additional organisations to the 41 reported by Meyer and Brown (1999) in their evaluation of DKNs as a potential policy option. They also reported that “of the networks and organizations established with government support, four are either no longer locatable or have not been updated for several years”. Finally, Lowell and Gerova reported a DKN failure rate of 27% (Lowell, 2004b). They question the sustainability of such networks and are more cautious than Meyer and Brown in their optimism regarding the effectiveness of DKNs.

We have performed our own internet survey of networks that we deemed ‘active’ in the previous reports and found that many websites either failed to upload or had not been updated for over one year, consistent with Lowell and Gerova’s findings. Through our internet search, we also found that governments with strong diaspora policies, such as India or China, tended to have a greater number of self-identified diaspora networks focusing on knowledge transfer between their ‘host country’ and their country of origin. Alternatively, countries with no diaspora policies appeared not to have many DKNs. This is not to say that there is a complete dearth of DKNs in countries that lack diaspora policies. For example, over 50% of Iran’s young, prize-winning scientists have left the country and the ministry of Science, Research and Technology has stated that it has no plan to address this brain drain.¹² Yet, according to Turner, Henry and Gueye,¹⁰ Iranian DKNs do exist. It would be interesting to determine if the lack of policy has acted as a catalyst for social entrepreneurship and thus motivated Iranian diaspora to create their avenues of knowledge transfer.

The South African Network of Skills Abroad (SANSA) is supported by the South African government and is cited as a promising DKN (Brown, 2003). Interestingly, a recent survey performed by the South African National Research Foundation (NRF) was conducted to revamp the SANSA website (Ravenhill, 2005). This survey reports that of a total of 2440 e-mail contacts present in the SANSA database, 32.51% of the surveys sent to members were undelivered and 13.11% bounced back. Out of the 1323 surveys that were delivered, 428 responses were received. One of the important results of this survey was the frequency of the website used by the members of SANSA: out of 426 responses (response rate varied by question), 38.5% and 39.5% said they infrequently or never use the website, respectively (Ravenhill, 2005). Finally, inline with past criticism of not
corresponding to the needs of the diaspora, a large number of survey respondents said that they did not feel they received value from SANSA. However, the report highlighted that the respondents wished to cooperate with SANSA to optimise the engagement of the diaspora group. Thus, this survey is indicative of how a seemingly good framework backed by the government may still not be useful to the end-users or effective in capacity building. This is not to say that the diaspora option is not valid, but rather emphasises the need for more empirical studies aimed at understanding the needs of the diaspora, involving them in the policy process and establishing mechanisms that will result in ‘true’ positive impact on development.

4 Policy prescriptions for turning ‘brain drain’ into ‘brain circulation’

4.1 Multilateral leadership

It is vital that the role of the international community not be overlooked when examining existing and possible models to engage the diaspora. This is especially relevant because one of the UN Millennium Development Goals (MDGs) focuses on global partnerships for development. In their pursuit to meet these goals, the UNDP is mobilising the “intellectual, technological, entrepreneurial and financial resources of the diaspora”. Several other international agencies including the International Labour Organization (ILO), The International Organization for Migration (IOM), the World Health Organization (WHO), the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the World Bank have made significant efforts to study the effects of migration and the role that diasporas play in development. While several international agencies spearhead programmes that aim to facilitate diaspora knowledge transfer, it is not clear whether in developed countries’ the governments specifically engage S&T diaspora as partners in their international development plans. Nevertheless, successful multilateral leadership models exist: TOKTEN was established in 1977 by the UNDP and is present in over 25 countries including Turkey, Palestine, Lebanon and Syria. TOKTEN facilitates the return of highly skilled workers for short periods of time to provide ‘technical expertise, policy advice and research’ to developing countries. However, despite its best efforts TOKTEN programs have not always been successful. Communication barriers, bureaucracy and the inability of certain countries to absorb and/or apply expatriate knowledge have been cited as challenges (Khadria, 2002).

4.2 National leadership by developing countries

In a recent report published by the UN Millenium Project Task Force on Science, Technology and Innovation, the authors concluded, “the onus is on developing country governments to design programs and offer incentives that enable expatriates to contribute to national efforts” (Juma and Yee-Cheong, 2005a). The recognition of diasporas by their home country is indeed essential and although integrating a large and diverse number of government institutions that may be in charge of diaspora issues is challenging, some governments have been successful in doing so: the IOM has been conducting a survey to
determine if and what type of government diaspora policies exist in the world. The IOM has so far received responses from 45 countries, including 34 developing countries. To date, results show that 95% of respondents claim to have diaspora policies in place. However, these policies exist across a variety of sectors including, economics, politics, culture and philanthropy, and thus are diverse in nature. Interestingly, the IOM survey shows that respondents from low- and middle-income countries stated that they “encountered difficulties in engaging with diasporas because of the latter’s reluctance to work with (their) home government, and in identifying willing partners and interlocutors”. This finding may imply that establishing credibility and trust is a large barrier faced developing countries wishing to engage their diaspora (Ionescu, 2005).

The question of whether the government diaspora policies are visible and accessible to the population they are targeting, which was raised during our preliminary internet search of developing countries’ government websites. Many websites were difficult to navigate and it was a challenge to clearly identify, with a few exceptions, if specific diaspora policies existed. One of the exceptions was India, and from our internet survey we found that the Indian government has made great strides in turning its brain drain into a brain gain. However, India’s ability to attract its diaspora back home should be partially credited to its booming ICT and biotechnology private sectors offer opportunities for skills of expatriates to be utilised, in addition to government’s ability to coordinate the policies and programmes of multiple government ministries including that of the Ministry of Foreign Affairs, The Ministry of Overseas Indians, The Ministry of S&T and The Ministry of Education. Specific government polices that have aided in knowledge transfer include: a Ministry of Overseas Indians 2005/2006 increasing their budget by 500%, the provision of dual citizenship, recognition of Persons of Indian Origin (PIO) through the creation of a special ministry, Pravasi Bharatiya Divas, an annual celebration/conference for PIO, and a Research Scientists Scheme which aims to bring back Indian nationals working overseas to teach in Indian universities. Interestingly, Pravasi Bharatiya Divas is also making diplomatic efforts to create or maintain connections with Indian overseas diaspora by celebrating their accomplishments abroad.

As it is accepted that S&T development is a key to economic growth and development, other countries such as China are increasingly focusing on ways in which to forge linkages with the overseas scientists. Similarly to India, the strong government policies in conjunction with a booming economy are credited for the return of expatriates. An example of a specific government policy is the commitment of US $25 million over a 15-year period to set up a website and centre to assist permanently and temporarily returned overseas Chinese scholars. As well, the policies supporting R&D, including those focusing on the development and expansion of research centres and ‘science parks’, have been integral to the success of knowledge repatriation in China. Another example is China’s 100 Scholar Plan, which aimed to attract 100 foreign educated returnees to work at the Chinese Academy of Science. Interestingly, the Chinese government also announced its intention to attract hundreds of overseas Chinese scientists with ‘western style’ salaries (Economist, 2002). Additionally, social policies such as increased accessibility to superior housing and education for their family are making overseas Chinese more amenable to the idea of returning home for temporary or even long-term stays. China’s success in repatriation can be best observed in Shanghai,
where more than 1700 firms (including health biotechnology firms) have been established by the expatriates (Zhenzhen et al., 2004). Similarly to India, China maintains connections to its diaspora by hailing them as ‘patriotic’ and praising them for raising China’s profile on the global stage.

Finally, other examples of national programmes geared at harnessing the diaspora include Mexico’s loan forgiveness programme, Becas CONACYT, which forgives student loans to Mexican students who have studied abroad if they return home to teach in a Mexican University (Lowell, 2001a) and Thailand’s Reverse Brain Drain Project, which connects Thai institutions with Thais living abroad to encourage and increase collaboration on various technology focused projects (Lowell, 2001a). Recently, Forum International for Ethiopians Living Abroad (FIELD) and Lem Ethiopia organised a conference focusing on “building bridges between the Ethiopian Diaspora and Ethiopia … to contribute to national development…” (FIELD, 2005). This conference and the Ethiopian government’s establishment of the Ethiopians Expatriates Affairs General Directorate and the Office of Coordinating Ethiopian Diaspora is a prime indication of the political will necessary to engage members of the diaspora (FIELD, 2005).

4.3 National leadership by developed nations

The political will and proactive engagement of skilled diasporas by developing countries is required but not sufficient to promote brain circulation. Developed countries such as Canada, Australia, France, UK, and the USA are large receivers of skilled scientists from the developing world. As developed countries benefit from this brain drain, we suggest it is also their responsibility to involve skilled diasporas in their international development-cooperation plans.

Many developed countries’ governments have Official Development Assistance (ODA) plans yet, non-aid policies such as harnessing the human capital of skilled diasporas do not figure prominently in these plans. There is a paucity of knowledge on factors that would encourage scientific diasporas to contribute to the development and innovation in their home countries without having to physically repatriate. The government of France has taken a first step towards exploring the diaspora option. The Ministry of Foreign Affairs commissioned Barre et al. to survey the scientific diasporas’ potential for development and results were published in 2003 (Barre et al., 2003). In the conclusion of this survey report, the first recommendation made to the French Ministry was

“take the diaspora option i.e., publicly state the principle that S&T diasporas are actors in co-development in the scientific and technical arenas, and declare the principle of an official policy of support for S&T diasporas” (Barre et al., 2003).

Other developed countries are also in a position to act on a diaspora option. For example, in the USA, there is no central policy addressing S&T diasporas as agents of co-development (Barre et al., 2003) but Barre et al. pointed out that “these notions [of co-development or S&T diasporas] do feature as criteria in funding procedures for international co-operative research projects.” (Barre et al., 2003). The most studied transnational S&T communities of the USA are the Indian and Chinese ICT diasporas.
The circumstances surrounding these US–China and US–India transnational ties are unique in that all the three countries have strong S&T clusters and thus “…their S&T co-operation with the USA is based simply on a spatial extension of the international scientific community’s own ground rules for research funding and performance” (Barre et al., 2003).

Therefore, while transnational ties arose quite spontaneously with China and India, other US skilled diaspora communities (e.g. African and Latin American) may need to be actively engaged in a co-development strategy. Active consultation of citizens for the poverty reduction is one of Canada’s International Policy goals. Moreover, Canada’s sense of global citizenship is captured in its 2005 International Policy Statement (IPS):

“This sense of global citizenship is reflected not only through the human ties of Canada’s many diaspora communities to their countries of origin, but also through Canadians’ donations of time, expertise and resources to help people and countries in need.”

However, as Robinson argues, the

“IPS-Development appears foggy as to how to mesh international development cooperation strategy for poverty reduction with the development resources embedded in these (skilled immigrant) communities, or how to engage transnational migrant communities as partners in development cooperation” (Robinson, 2005).

Although the plan may be unclear, Canada’s ability to act is not:

1 The Government of Canada has a track record of serious efforts aimed at international development and a commitment towards a knowledge-based approach in improving the global health and economic development.
2 Canada’s historical recognition of the benefits of multiculturalism (Canada was the first country to adopt an official multiculturalism policy), places it in a prime position to engage scientific diasporas in capacity building.

5 Conclusion

S&T plays a role in the development of global health and world economies, yet without skilled human capital, technological progress appears out of reach for most developing nations. If highly skilled professionals in diaspora communities are encouraged to play important roles as bridges for technological, economic and health development in their home countries, the potential to have a sustainable impact beyond aid is substantial.

To contribute to the evidence that supports a role for scientific diasporas as co-development partners, we are currently conducting empirical studies of diasporic researchers and entrepreneurs, working in three major life science clusters in Canada, with respect to their experiences in- or desire for- global partnerships to allow developing countries to benefit from their expertise. Our goal is to uncover issues that will guide policymakers and the governmental practices in the international development arena.

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Notes
4http://www.gcim.org/attachments/GMP%20No%2030.pdf.
5http://www.sims.berkeley.edu/~anno/speeches/braindrain.html.
6http://www.sims.berkeley.edu/~anno/papers/bangalore_boom.html.
17http://www.aeanet.org/publications/IDJJ_AeA_Competitiveness.asp.
21http://indiaday.org/objective/index.asp.
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