Legal and Regulatory Frameworks and Scientific Mobility

Giving Something Back: Exploring Making a Contribution at a Distance: Policy and Practice

Thematic Paper

Liz Oliver

ResIST Deliverable # 9

March 2009

This paper was prepared as part of ResIST – *Researching Inequality through Science and Technology* - contract CIT5 - CT2006 – 029052 - under Priority 7 of the 6th Framework Programme: Citizens and Governance in a Knowledge-Based Society. For more information see http://www.resist-research.net. ResIST acknowledges European Commission support with thanks.

Giving Something Back: Exploring Making a Contribution at a Distance: Policy and Practice

Introduction

This paper seeks to bring together a key feature of the emerging science and technology policy at EU level with empirical data that explores the experiences of migrant scientists themselves. As Mahroum argues migration is becoming an “inseparable segment of national technology and economic development policies” he notes that “competition for highly skilled labour will continue to be fierce” (2001: 27). The decisions that individual scientists make therefore about where to live and work have significance in terms of economic growth and development. In the context of highly skilled migration from developing countries, the movement of scientists poses a risk to the sending country. However new theoretical approaches to understanding this dynamic emphasise the role of individual agency within migration processes and highlight the potential for highly skilled migration to benefit the sending countries in some ways. The extent to which the loss of highly skilled personnel can be fully 'compensated' through networks and circulatory migration patterns is not clear (Ackers, 2005). However, what is clear is that careful policy making is necessary as a means to harnessing the potential of scientific networks to benefit sending countries.

This paper seeks to interrogate the key legal and policy tools developed at EU level to attract scientists internationally. The aim is to consider the extent to which such mechanisms can support a level of investment in developing countries that send or lose their scientific personnel to EU Member States. The paper then seeks to explore a key theme that has emerged from interviews with South African and Turkish scientists who work in the UK and Germany, that of 'giving something back'. This theme resonates with the literature on highly skilled migration that emphasises the agency of these actors and the potential for scientific diaspora to contribute to sending countries through networks. The issue of 'giving something back' raises questions around the relationship between geographic mobility and knowledge creation and dissemination, the extent to which migration can be considered a 'total loss' to the sending region and the importance of engaging highly skilled professionals themselves as stakeholders through policies that seek to capitalise on their skill.

The first section seeks to introduce some of the literature in the area of engaging scientific diaspora, the paper then goes on to explore the key legal and policy documents in this area and finally an analysis of the interview data on the theme of 'giving something back' is introduced.

Engaging the Diaspora to Mitigate Brain Drain

Highly skilled emigration is *the* principal risk that international migration poses to developing countries (Dayton-Johnson et al., 2007). The impact of the emigration of highly skilled personnel however is a complex matter and is likely to differ depending on the context. The nature of the fiscal investment in the individual through education for

example may differ between States and between professional groups, the potential for the skills of individual professionals to match labour market demands may also differ. For Ackers the key to understanding the impact of highly skilled migration lies in understanding "who is moving (and the quality of their skills) and the nature of their migration" (Ackers, 2005: 99). In the context of the migration of science and technology professionals where international migration and collaboration are highly valued aspects of both knowledge generation and individual career development, an understanding of the role of migration in knowledge generation and flow is critical (Meyer, 2001; Ackers, 2005). In many respects it is important for scientists from developing countries to be internationally mobile as a key means to access international networks and resources. The extent to which developing countries can harness new ideas and technologies in order to raise productivity however is dependent on a) whether knowledge can flow back to the sending countries and b) whether knowledge and skills can be utilised in innovative and productive ways.

Empirical research with mobile science professionals reveals a variety of resources that can be accessed by moving to another location, ranging from large and expensive equipment to the reputations of Nobel Prize winners (Ackers, 2005; Oliver, 2007). As Law argues, scientific knowledge can be understood as an outcome of a "network of heterogeneous materials" which encompasses both human and non-human elements (Law, 1991: 16). It is clear that researchers move within and between networks of human and non-human resources aiming to conduct scientific research and to build up their reputation within a given field. Meyer argues that understanding the role of socio-technical networks in knowledge intense activities is a useful framework through which to understand and explain highly skilled migration (Meyer, 2001). Here the migration process is constructed through networks of actors and intermediaries. Ackers sets out a 'menu' of factors that contribute to an expectation of mobility within various scientific fields and disciplines, however she emphasises the individual context, highlighting role of the lifecourse in both shaping which factors appear 'on the menu' and the priorities attached to them (Ackers, 2005). Williams and colleagues also stress the importance of individual context and biography in shaping migration and knowledge transfer processes noting that "Knowledge does not simply translate into action. Rather, the potential for action is dependent on position, in terms of class, gender and ethnicity" (Williams et. al., 2004: 43).

What relevance do these frameworks have for policy development in the area of science migration from developing countries? Network approaches to understanding highly skilled migration emphasise the fluidity and circulatory potential of geographic mobility. Such approaches undermine the extent to which migration can be considered a single permanent move and blur the direct association between migration and loss (King, 2002; Ackers, 2005). Docquier and Rapoport (2004) highlight a shift in the literature on brain drain since the 1970s from an emphasis on detrimental short-term losses to the potential for developing countries to experience social gains as a result of highly skilled migration. Cervantes and Guellec acknowledge that brain drain continues to pose tangible problems for sending countries however they argue that migration policy provides an opportunity for developing countries to gain something from the process.

> ‘The risk of a brain drain is real. Yet countries can create opportunities for research, innovation and entrepreneurship at home and stimulate a return flow of migrants and capital, as well as win access to international innovation networks. With the right mix of policies and sustained international co-operation, several countries could, as one Indian official pointed out, see the “brain drain” be transformed into a “brain bank”’ (Cervantes and Guellec, 2002: 1).

Meyer argues that “highly skilled emigration no longer appears as exclusively bad for developing countries” and emphasises the role of policy makers and individual actors in terms of accessing external resources and also in developing the incentives and conditions for effective returns. Meyer argues:

> ‘Far from emotional accounts of global volatility of highly skilled personnel with driving forces far beyond actors control [the network approach] asserts the role of human agency and policy making since the situation has never been out of their (collective) hands’ (2001: 104).

As Ackers (2005) argues, the extent to which networks can truly compensate sending regions for the loss of highly skilled personnel is unclear. Indeed Dayton-Johnson et al. caution that benefits accrue to the home country “only under somewhat special circumstances” “if at all” (Dayton-Johnson et al., 2007: 64). However, what is clear is the potential to develop policy in the area of migration that can engage scientific diaspora to the benefit of sending countries and the importance of investigating the best ways to do this.

Ackers identified an agenda for future work in the area of studying the causes and consequences of science mobility, one of the factors for consideration that she identified was:

> ‘The extent to which international migration spawns other forms of knowledge generation and transfer which are not directly related to physical presence, such as diasporic networks and more specific forms of scientific exchange’ (Ackers, 2005: 123).

The Relationship between Socio-technical Networks and Highly Skilled Diasporas

Recent years have seen a growing interest in Diaspora networks and a growing role for the Diaspora in migration and development policies (de Hass, 2006). As Lowell and Gerova note:

> ‘while diasporas have long been studied as independent phenomena, a focus on their role in economic development is recent’ (2004: 1).

In the context of migration policy, Diaspora networks are increasingly seen as a potential route to promote the return of migrant professionals and more recently to promote the mobilisation of Diaspora skills through formally constituted groups (Dayton-Johnson et al., 2007). “The Diaspora option” as Meyer and Brown described it, refers to attempts to engage with the knowledge and expertise of highly skilled expatriates in lieu of return (Meyer and Brown, 1999). A range of formal scientific Diaspora networks and

organizations have been set up and some have gained government recognition and funding (for a description of such organizations in the South African Context (see Mouton et al., 2007). The 'Africa Diaspora Brain-Gain Project' funded by The International Council for Science Regional Office for Africa (ICSU ROA) and South Africa's National Research Foundation (NRF) is an example of an initiative designed to specifically to promote the mobilisation of the skills of the African scientific Diaspora to support projects in Africa (Africa Recruit, 2006). Although such organizations cannot be considered a homogenous group, they generally aim to harness the activities of individual migrants to the economic or intellectual benefit of the sending countries. Meyer and Brown see Diaspora networks as a vehicle through which to capture the individual activities of expatriate science researchers to the benefit of the sending country:

> ‘relationships between expatriate intellectuals and their mother country have often existed in the past. What is new today, is that these sporadic, exceptional and limited links may now become systematic, dense and multiple’ (Meyer and Brown, 1999).

Senguin et al. concur, their study of life science researcher and entrepreneurs from developing countries in Canada found a range of individually initiated activities however few of these were systematic or formalised. They argue that more organised structures would make these activities more effective (Senguin et al., 2006). Recent research into formal scientific Diaspora networks however highlights some limitations in the extent to which they do capture the activities of the Diaspora and to which knowledge and expertise flow back to the sending country. Lowell and Gerova conclude that:

> ‘Striking the right balance between a sending country’s engagement in making use of its expatriate communities and the wishes and needs of such communities has yet to be found’ (Lowell and Gerova, 2004).

It would appear that further research is required into a) what is happening ‘on the ground’ and b) how formally constituted networks could harness these activities.

So aside from these formal organizations, what are scientific Diasporas and do they operate in similar ways to other more amorphous Diasporic networks? Should science and technology professionals be considered part of distinctly international networks of human and non-human actors and if so what is the role for expatriate or co-ethnic communities? Ackers and Gill studied the role of social networks in facilitating and directing the international mobility of Polish and Bulgarian science researchers within the EU. Their work emphasises the role of international social networks and funding steams and demonstrates that highly “international environments” and “global cities” attract scientists from around the world. Local expatriate communities or family ties played a more minor role in shaping or directing geographical moves (Ackers and Gill, 2008: 130). In some cases expatriate communities of science researchers could be found within the host countries however these communities were “somewhat different” to local expatriate or family networks and “harder to pin down”, focusing primarily on social activities (Ackers and Gill, 2008: 132).

The role of expatriate science communities in facilitating migration and supporting migrant science researchers however may differ depending on the career stage of the researcher and on the context or geography of the move. Research into the migration of

graduate students to the United States has found a clustering of foreign born students within labs with directors of the same nationality (Lieff Benderly, 2007, Tanyildiz, 2007). Within this context Tanyildiz emphasises the value of expatriate networks to graduate students, particularly where language is an issue.

> 'For foreign students, social networks are crucial in finding accommodation, goods and services, social and economic information, as well as emotional support. Social networks serve as a guiding source for foreign students throughout their education' (Tanyildiz, 2007: 6).

Importantly Ackers and Gill distinguish links formed between expatriates within the host country from links retained or established with colleagues in the sending country. A key finding of their study was that links with well networked individuals within the sending country played a central role in shaping both initial and future migration.

> 'The most effective networks in this context are typically between highly established professors in the respective countries and are primarily characterized by international – as opposed to expatriate – relationships' (Ackers and Gill, 2008: 138).

Professors and supervisors were key information sources and facilitators of moves. This finding resonates with that of Tanyildiz's case study of the migration of Turkish graduate students to the United States. She identified a 'tunnel effect' between key institutions in Turkey and the US (here Middle East Technical University and Georgia Institute of Technology). Graduate student mobility and exchange was supported by professional and friendship relationships between lab heads based within the two intuitions (Lieff Benderly, 2007).

It is clear that within the context of the international migration of scientists, national identities and links with sending countries are not 'lost' to international or global affiliations. However, rather than generating distinct expatriate or co-ethnic science communities, national identities and ties shape individual's professional activities within international scientific networks. Not only do these interactions play an important role in shaping migration, they also shape knowledge transfer and exchange across borders. Indeed Ackers and Gill found that:

> 'There was some evidence of a renewed interest in establishing and reinvigorating links with the scientific diaspora but it was not clear that these networks currently played a major role in shaping migration patterns or reverse knowledge transfer. Connections with scientists in their home countries on the other hand, play a very critical role in both respects' (Ackers and Gill, 2008: 148).

The key to understanding knowledge flows between countries that send or receive science professionals therefore is to understand how scientists engage with the sending country within the context of international networks of scientific actors and resources. This will bring in third and further dimension to our analysis, the sending country, the receiving country and international science networks.

Knowledge Remittances?

Remittances, which can be described as "how migrants contribute to the economic development of their countries of origin" (Page and Plaza, 2006: 246), have been playing an increasingly important part in economic and development policies (Page and Plaza, 2006). Dayton-Johnson et al. (2007) highlight the two key perspectives from which remittances are commonly understood, the micro level which considers the value of remittances within households and the macro level which focuses on the nature of remittance flows and their impact on national economies. As noted by our colleagues Mouton et al.:

> 'remittances are not an outcome of a deliberate policy intervention on the part of governments, either by the recipient or sending country, but are a voluntary initiative from the migrants themselves' (Mouton et al., 2007: 40).

In recent years the volume of money remitted by migrants globally has increased, causing governments to pay attention to these flows within their policies on migration and beyond (Dayton-Johnson et al., 2007). Migrant remittance flows are complex and unevenly distributed (Box and Basri, 2008). The relationship between earnings, skill levels and remittance motivations is also complex (Dayton-Johnson et al., 2007). However, research suggests that highly skilled migrants remit less money than their less skilled counter parts (Khadria, 2002; Parthasarathi, 2006, cited in Mouton et al., 2007). A key determinant of remittances and their volume is the location of the family. Where migrants have left their immediate family in the sending country they are likely to remit far more money (Dayton-Johnson et al., 2007). As Mouton et al. note, the likelihood that highly skilled migrants will move with their immediate family could be a factor here.

Whilst big questions remain about the extent to which financial remittances of the highly skilled serve to mitigate the effects of their mobility, attention has turned towards the extent to which knowledge and skills flow back to the sending countries when skilled migrants leave. The focus of discussions has been around the role of formalised Diaspora networks.

I would like to argue that we should understand the knowledge contributions of highly skilled migrants in a similar way to financial remittances, they are individually motivated and directed. Like the international financial networks through which money moves between countries, socio-technical networks operating globally shape the conduits of knowledge. The starting point for our analysis should not be at the level of international Diasporic networks determined by nationality or co-ethnicity. Rather we should explore the extent to which individuals engage with global socio-technical networks (themselves shaped by nationality and identity) to share their knowledge with colleagues and friends in the sending country. The starting point should be at this micro level of activity which has not yet been sufficiently captured within international policy making forums (Senguin et al., 2006).

This paper seeks to respond to Ackers call for further research and to Meyers' request to emphasise individual agency and the role of policy makers. The first half of the paper looks at the policies of the European Union as a key receiving region. It seeks to understand the approach taken to attracting researchers from outside of the EU and to

identify the potential to engage scientific diaspora in contributing to the sending country. The second part of the paper uses interviews with migrant scientists to explore the theme of 'giving something back' looking at what scientists themselves view as forms of contribution, identifying why or why not scientists would engage in such activities and how those who do maintain connections with their sending countries contribute to knowledge generation and exchange.

EU Law and Policy – Third Country Nationals and the European Research Area

Geographical mobility is a central facet of the EU's plans to create a European Research Area. The mobility of researchers within the EU is seen as an important element of training and development and key to promoting the creation and dissemination of scientific knowledge. Moreover the European Union has been keen to develop policies designed to attract researchers from outside of the EU to work within research organisations in the Member States. The emphasis on attracting the best researchers internationally has led to the development of hard legal instruments in the area of immigration that seek to make it easier for skilled researchers to enter the EU. These efforts are combined with a series of policy initiatives and funding steams that have been designated to improve the immigration of research personnel from overseas. Such approaches reflect a general trend towards selective immigration policies that has developed since the 1980s, Docquier and Rapoport suggest that:

> ‘What started as an effort to increase the "quality” of immigration in countries such as Australia or Canada has developed into an international competition for attracting the highly educated and skilled’ (Docquier and Rapoport, 2004: 3).

Indeed, an ability to attract substantial numbers of research personnel from outside the EU is clearly seen as a key element to the success of EU economic plans and an area within which the EU seeks to increase its competitiveness. Within a recent communication, the Commission states:

> ‘The ability of the US system to draw upon a global talent pool is reflected in the clear lead which the US enjoys over the EU in terms of the best research. The influx of third country researchers to the EU is much lower, while the global competition for the most talented researchers is increasing with new players now able to offer attractive conditions’ (CEC, 2008a: 4).

I think it would be useful to outline the key tools established by EU institutions to facilitate research co-operation with third countries and in particular to flag up the mechanisms by which individual researchers are encouraged to move into the EU. Maintaining a focus on the theme of 'giving something back', this section will seek to highlight the EU's approach to supporting capacity building within developing countries and to link that to the key mobility schemes.

Third Country National Researchers and plans to develop the European Research Area

In 2000 the European Commission set out plans to develop a European Research Area (ERA). Within it, the Communication ten aspects of the ERA were set out and one of these was "Improving the attraction of Europe for researchers from the rest of the world." (CEC, 2000: 8). The Communication stresses the need to make Europe an attractive destination for researchers internationally. It suggested that national funding programmes should be opened up to nationals from third countries and possibly that a series of grants could be developed to attract third country nationals. In addressing the needs of developing countries in this context, the Commission emphasises the importance of return.

> 'In the case of developing countries, to guarantee the development of local research potential, this system should be such as to encourage the beneficiaries to return to their countries in order to take advantage of their experience and to spread the knowledge they have acquired... The possibilities provided by the science and technology cooperation agreements between the Union and a number of third countries should be maximised in these respects' (CEC, 2000: 19).

The European Commission envisaged developing a series of grants and funding streams designed to encourage the immigration of expertise from overseas. These schemes were to be open to researchers from developing countries however the Commission envisages using a range of further measures through international co-operation agreements to invest in capacity building within developing countries.

Within the Commission's Communication on mobility within the ERA the centrality of the movement of scientific personnel to the development of a European Research Area is stressed once again. The Commission seeks to instil a mobility element within each stage of research careers and this is to include attracting researchers from third countries (CEC, 2001). Initiatives designed to encourage the outmigration of researchers from developing countries are to be twinned with actions that seek to promote capacity building – the Commission aims for a "symbiotic collaboration":

> 'In making Europe more attractive for researchers, special attention needs to be paid to prevent new forms of "brain drain" from third countries with less developed research capacity. Rather, the present strategy should strengthen and develop a symbiotic collaboration with these countries, thus encouraging them to build up their own research capacity' (CEC, 2001: 6).

The Most recent Green Paper on the ERA set out a proposed approach to "Opening [the ERA] to the world: international co-operation in S&T" (CEC, 2007a). This would involve EU institutions co-ordinating an approach to international co-operation in science between the Member States and the EU. States would be grouped into neighbouring countries, developing countries, industrialised and emerging economies and the nature of co-operation would differ depending on the group to which the State belongs. In the case of developing countries the approach favours strengthening capacity as well as working as partners in global initiatives. Mobility however is seen as a general issue that is to be approached with all partner countries. These policy initiatives would favour the use of

soft legal mechanisms such as the 'open method of co-ordination' and place an emphasis on variable geometry in the development of EU co-operation. So we can see the Union developing a key role in facilitating the co-ordination of national policies, with plenty of scope for the individual Member States to determine their own policies and the extent to which they will buy into EU level co-operation.

A dual approach is emerging here entailing the use of funding streams made available under the Framework Programmes to aggressively promote mobility on the one hand and the capacity building and cooperation activities developed through the framework programmes and specific cooperation agreements and conventions on the other (CEC, 2008b). In September 2008 the Commission published a Communication on 'a strategic European framework for international science and technology cooperation' (CEC, 2008b). The Communication asserts the importance of developing scientific cooperation internationally with initiatives targeted at certain scientific issues or at countries determined by either their proximity to the EU or the level of their economic development. Mobility of researchers is considered an “essential feature” of international cooperation and it is clear that the EU is seeking to compete for the best researchers (CEC, 2008b: 14). However, there is a recognition that researchers from developing countries should be encouraged and supported to contribute to capacity building within the sending country:

> ‘researchers who come to Europe from emerging economies or developing countries must be enabled to contribute to their own countries’ development. Such connectivity, through networking, or “return” grants, will make brain circulation a reality’ (CEC, 2008b: 14).

Within this Communication the emphasis on return is tempered a little by reference to networking activities and virtual forms of collaboration.

The following section introduces the differentiated nature of collaboration between the EU and third countries by using South Africa and Turkey as case studies.

How are relationships with third countries defined?

Within the framework set out above there are a number of very concrete ways in which the EU has and plans to act and these are as follows:

- Hard and soft legal measures designed to facilitate access to EU Member States for third country national researchers;
- The provision of funding through the framework programmes;
- Drawing up cooperation agreements and conventions.

The examples of Turkey and South Africa serve as useful illustrations of how the EU currently engages with third countries. A brief introduction to the relationship between these two countries and the EU, specifically in the area of science and technology will follow.

Turkey is a candidate country for EU membership (European Council, 1999). As a candidate country, Turkey does not have full access to EU programmes (Karatayli, 2007). As part of the accession process, Turkey must negotiate 35 'chapters' through which

compatibility with EU law is assessed. The Science and Research chapter was the first to be discussed and closed. On 12 June 2006 the Council of Ministers concluded that no further negotiations were required and the chapter was closed (THE, 2006). In terms of the Framework programmes Turkey was involved in FP5 on a project-by-project basis but participation has grown through FP6 and FP7 (CEC, 2003). On the 1st June 2007 Turkey signed a Memorandum of Understanding with the European Commission which allowed it "associated status" and therefore full participation in FP 7. This means that Turkish individuals and institutions can participate in calls for proposals and compete equally with the EU Member States for research cooperation and support actions (CEC, 2007b).

South Africa is a third country. A bilateral agreement entitled 'agreement on scientific and technological cooperation between the European Community and the Republic of South Africa' was signed in 1996 and came into effect in 1997 (Council Decision of 10 November 1997). When this agreement was signed FP4 was in operation and South Africa was included within the actions. Continued participation in the FPs has been maintained through extensions of the agreement. Through FP6 the European South African Science and Technology Advancement Programme (ESASTAP) was established. This was funded as a specific support action by the European Commission with joint funding from South Africa's Department of Science and Technology. The ESASTAP is designed to be a platform from which to promote cooperation between South Africa and the EU and has also served to facilitate activities involving individual Member States with which South Africa has concluded bilateral agreements (CEC and DST, 2007). Under FP 7 South Africa is considered an 'International Cooperation Partner Country' and within the specific field of 'Cooperation' under FP 7 South Africa is defined as a developing country. This means that South African researchers are eligible to apply for FP7 funding subject to limitations which differ depending on the grant but which generally specify a level of involvement from Member or Associated States (Decision No 1982/2006/EC of the European Parliament and of the Council of 18 December 2006: 40-41). Through FP 6 South African researchers participated in some 117 international research projects and a survey conducted by ESASTAP indicates widespread awareness of FP 7 opportunities (CEC and DST, 2007). EU policy documents indicate an intention to develop more bi-regional as opposed to bi-lateral agreements. In this context the relationship between the EU and key regional organisations such as the AU could shape the nature of the relationship with South Africa. Under the FP 7 capacities programme for example bi-regional cooperation is promoted as a mechanism to establish information exchange and dialogue. South Africa is a partner country within the INCO-NET project CAAST-Net which focuses on dialogue in science and technology policy and activities within Sub-Saharan Africa (CAAST-Net, 2009).

The following sections will take a quick look at measures designed to facilitate the migration of researchers and the funding that has been made available to individual researchers through the framework programmes, it is through these two key initiatives that the EU engages with individual researchers from outside the EU.

'The Scientific Visa' – A key legal instruments to promote the mobility of Third Country National Researchers

The Commission proposed a Directive and two Recommendations on admission of Third Country National Researchers. All of these measures have been adopted. This section will outline the specific procedure for admitting third-country nationals for the purposes of scientific research that was introduced by Directive 2005/71/EC of 12 October 2005. This Directive is designed to facilitate the admission and mobility of Third Country National researchers into and within the EU for stays of longer than three months. The subsequent sections then go on to look at the Recommendation on short-term stays.

The principal feature of the Directive is the procedure that is established to allow researchers access to Member States in order to carry out a research project (Article 1). I will focus on this aspect of the Directive and simply introduce the key features as space does not afford a full and detailed analysis of this legal instrument here.

As Peers notes, this special procedure

> ‘entails a significant delegation of power from national immigration authorities to research institutions as regards the admission of researchers’ (Peers, 2006: 225).

The key to admission is a 'hosting agreement' drawn up between a recognised research institution and a third-country national who seeks to move to a Member State to carry out a research project. The Directive contains detailed rules on the procedures and conditions for granting approval to research institutions (Article 5). Once research institutions have been granted approval they may draw up hosting agreements with third country national researchers. These agreements will set out the conditions under which the researcher will carry out a project and the institution will host the researcher (Article 6). The directive specifies a number of conditions that must be met before a hosting agreement may be signed. Organisational approval must be obtained for the research project following an examination of the purpose and duration of the research and the financial resources to carry it out as well as the researcher's qualifications. The researcher must have the financial resources to cover their expenses and return travel costs and must be covered by health insurance. Finally the hosting agreement must set out the legal relationship and working conditions of the researchers.

For a researcher to be admitted to a Member State they must present; a valid travel document, their hosting agreement, in some circumstances a statement of financial responsibility issued by the research organisation and they must not be considered to pose a threat to public policy, public security or public health (Article 7). If these conditions are met the researcher shall be granted access to the Member State. The Member State must issue the researcher with a residence permit of at least one year or where the project is shorter than a year, for the duration of the project. The permit must be renewable if the conditions are still met. The Directive also allows for mobility between Member States (Article 13). A researcher may carryout research in another Member State for up to three months subject to resources and public policy, public security or public health stipulations. For periods of over three months the second Member State may require a new hosting agreement.

The deadline for transposition of this Directive into the laws of the Member States was 12th October 2007. Peers predicts that this Directive "will go some way towards achieving the objective of increasing admission of a category of migrants whose admission would be in the economic interests of the European Union" (Peers, 2006: 227). However, the European Commission reported slow progress towards achieving this objective. By May 2008 several Member States had failed to implement the Directive into their national laws (CEC, 2008). It is also significant to note that the UK has opted out of this Directive.

The conditions for entry and for continued stay laid down within the Directive revolve around the research project, the funding available to carry out the research, the skills of the individual and the individual's own financial independence. There is nothing in the main body of the Directive that could compel a Member State to take measures that would promote a symbiotic collaboration if researchers had left developing countries. However one of the recitals within the preamble nods towards measures to promote return and reintegration.

> 'Implementation of this Directive should not encourage a brain drain from emerging or developing countries. Back-up measures to support researchers' reintegration into their countries of origin as well as the movement of researchers should be taken in partnership with the countries of origin with a view to establishing a comprehensive migration policy' (recital 6).

Once again the 'back-up' measures that underpin a more sustainable approach to migration are to be developed through partnership with developing countries rather than engaging the individual themselves. The following section looks at how the EU funds the mobility of scientists from third countries.

Pending the implementation of the Directive, a Recommendation was adopted that called on the Member States to begin to facilitate the admission of researchers already (Council Recommendation of 12 October 2005).

The above measures are complemented by a Recommendation on short-term stays (for example of up to three months (Recommendation of the European Parliament and of the Council of 28 September 2005). The preamble to the Recommendation notes the need for increased numbers of researchers within the EU if the Lisbon goals are to be achieved. It describes an envisaged strategy for delivering these increased numbers based on "a series of interlocking measures" one of the four measures detailed is:

> 'opening up the Community to third-country nationals who might be allowed to enter and travel within the common area for the purposes of research' (*para. 4.*).

The Recommendation seeks to bring researchers under the umbrella of existing measures that allow access for short stays within the Community (Regulation (EC) No 539/2001). It also suggests the exchange of information and best practice between the Member States relating to developing measures on short stay visas for researchers from third countries. Because the measure falls within the Schengen acquis certain Member States will not be affected (Denmark has the option to adopt the recommendation and the measure does not extend to the UK or Ireland) whilst key associated states are included within the adoption of the Recommendation (Norway, Iceland and Switzerland).

The aim of the Recommendation is to provide researchers from third countries with access to periodic short stays within host institutions in the EU whilst maintaining longer-term employment in the sending country. Para. 15 of the preamble states:

> 'This Recommendation is also intended to provide a flexible formula for researchers who wish to maintain a professional link with an organisation of their country of origin (e.g. by spending periods of up to three months every semester in a European host research organisation located in the common area while continuing to work the rest of the time in the research organisation of origin).'

The flexible formula envisaged by the recommendation includes the following elements.

- A quicker examination of the visa applications of researchers
- Multiple entry visas attuned to the length of research programmes that researchers are part of
- Harmonised approach to the requirements on supporting evidence within researcher's visa applications in consultation with approved research organisations
- The issue of visas without administrative fees
- Including the issue of visas to researchers within local consular cooperation in order to promote best practice
- To supply the Commission with information on best practice

This measure points towards a more circulatory approach to migration such as to facilitate networking activities. Within this context, the research project and research institutions play a key role in shaping migration entitlements and patterns.

Third Country Nationals and Framework Programme Funding

The Framework Programmes (FPs) are the vehicles through which the EU funds research activity and FP 7 covers the activities within the period of 2007 to 2013. In recent years (particularly following FP6) a greater emphasis has been placed on international co-operation in science and technology. Within FP 7 three key objectives have been set out in this area and one of these is

> 'Supporting European competitiveness through strategic partnerships with third countries in selected fields of science, and by engaging the best third country scientists to work in and with Europe' (DG Research, 2007: 6).

Across FP7, activities are grouped into four categories; Cooperation, Ideas, People and Capacities. EU institutions have been keen to strengthen the international dimensions of FP7 and each category contains some element of international co-operation. It is within the 'People' category that funding for the mobility of individual researchers is made available. The overall objective of this programme is "to make Europe more attractive for the best researchers" (CEC, 2008c). A series of mobility grants have been made available under this category and they seek to

> 'To increase the quality of European research by attracting research talent from outside Europe and fostering mutually beneficial research collaboration with researchers from outside Europe' (CEC, 2008c).

The main mechanism by which third country national researchers are engaged in this category is through international incoming fellowships. These grants are available to third country national researchers to work in research institutions in EU Member States for a period of one to two years. Where researchers are from a country with which the EU has an international co-operation agreement, funding is available for a reintegration phase of one year to encourage return. So we can see an emphasis on return as the principle mechanism by which researchers are encouraged to contribute to their sending state. EU funding is also available to support the opening up of national research funding schemes to encourage migration both within the EU and internationally. Here FP7 funding is available to co-fund national schemes. In addition to the fairly traditional mobility grants FP7 introduces a new initiative called the International Staff Exchange Scheme. With this scheme we can see a more flexible approach to mobility and collaboration being promoted. Here funding is available to support partnership and networking activities through funding short term stays where EU national researchers are active in international research partnerships.

Having looked at some of the mechanisms by which the EU engages individual researchers we can see that the EU is keen to aggressively promote the immigration of scientists from outside the EU regardless of the States from which they leave. The Union also develops parallel measures designed to promote capacity building and therefore more favourable conditions for return within selected sending countries. The following sections will explore the potential to engage researchers from developing counties within these processes by exploring the theme of 'giving something back'.

What, Why and How, Exploring the theme of 'Giving Something Back'

The following sections explore the theme of 'giving something back'. This study has found that making a contribution to the sending country is an important goal for many migrant professionals. Although returning to the sending country is considered by respondents to be the principal mechanism by which they can feed the knowledge and skills that they have gained abroad back to the sending country, many believe that they can make a contribution even if they don't return. Within this study no respondents discussed contributing to the sending state through formally constituted Diaspora groups, although some respondents were funded by schemes in the sending country and maintained contact through the funding scheme. Very few respondents discussed involvement with informal networks consisting exclusively of nationals of the sending state or co-ethnics. Scientists appear to network through academic disciplines involving international members.

Because the activities described are commonly carried out on an individual basis they are not readily captured by quantitative studies of highly skilled migration moreover their value is difficult to quantify. The qualitative approach taken within this study provides rich data sources relating to the experiences and reported activities of individuals allowing us to explore some of these 'hidden' somewhat informal activities in more detail. The aim of this section is not to establish exactly what the country gains or loses from migration but to explore activities that are currently happening and to think about how

migration policies can harness the status quo to maximise the benefit to the home or sending country. In answering the questions what? why? and how? the following sections seek to establish what kinds of activities involving the sending state are currently being engaged by migrant research professionals, what motivates migrant professionals to continue to engage with the sending country when they are based overseas and finally what factors contribute to successful ongoing collaborations.

Interrogating the data for Information on 'Giving Something Back'

The following section draws from empirical evidence generated through interviews with mobile professionals. The empirical work was conducted within a cross-national team incorporating four partners based in South Africa and Turkey (identified as 'sending' countries) and the UK and Germany (identified as 'receiving' countries). The team was split into two pairs containing a sending and a receiving country (South Africa and UK were paired and Turkey and Germany were paired) and interviews were conducted with research professionals who were either living and working in the receiving country or who had experience of working in the receiving country but had subsequently returned to the sending country. Each partner team was to interview a total of 25 respondents thus contributing to a bank of 100 'case studies' of highly skilled migrants. Because some of the teams conducted key informant interviews as part of their sample, the total number of interviews with mobile professionals themselves was 96. In order to gain an in-depth understanding of the professional context within which individuals migrate, two groups of research professionals were targeted, namely researchers in the medical and life sciences and researchers in physical sciences and engineering. The empirical focus of the case studies was designated as follows:

- South African researchers in medical and life sciences in the UK;
- South African researchers in medical and life sciences who have returned to South Africa;
- Turkish researchers in the physical sciences and engineering in Germany; and
- Turkish researchers in the physical sciences and engineering who have returned to Turkey.

The focus of this paper is on 'giving something back'. Within the sample around 27 out of 96 (28%) respondents talked directly about feelings relating to 'giving something back' or making a difference to the sending country. The majority of respondents who articulated these feelings were based in the receiving countries. A total of 82 respondents (85%) gave examples of ongoing association with professionals in the sending country. The following sections look into the informal professional contributions that highly skilled migrants make to their home states at a distance or the extent to which working in the home or sending country can be enhanced by international links and collaborations made whilst working abroad. It is important to note that the respondents were not directly asked about 'giving something' back – this is a theme that has emerged from the interview data. The interview data was grouped where respondents talked about their own thoughts or opinions on making a contribution to the sending country and into examples of forms of ongoing work or collaboration with the sending countries.

What?

So what kind of activities are we 'getting at' here? The following text is an extract from an interview with an immunologist from South Africa who is living and working in the UK. She is unsure about whether she will return to South Africa but she explains that she thinks 'brain drain' is understood in a very black and white way and that the contributions of lots of people are often overlooked.

> '...you know it's never an easy decision to leave home, you always do stay connected in whatever way that is, whether you physically move back there or whether you use your resources to kind of help in other ways...' [U16].

In a similar vein the following respondent tells us that she tries to maintain a relationship with colleagues in her former lab. The following extract is the response to a question on the impact of migration on sending and receiving countries:

> '...on the whole it is a good thing for the receiving countries and it can be a detrimental thing for the sender but it doesn't have to be an entirely bad thing, for me I try as much as I can to keep contact with people in my former lab... ultimately I hope to be able to give something back in that way' [U08].

Respondents discuss a range of ongoing associations with professionals in the sending countries ranging from totally informal friendships through informal knowledge exchange and sharing ideas to training doctoral candidates, delivering professional training, conferences and seminars through to joint collaborative projects and charitable work.

It is important not to overemphasise the extent to which connections and contributions with home institutions can mitigate the impact of 'brain drain' indeed the majority of respondents primarily talked about returning to their home or sending countries as the key way of 'giving something back'. The following respondent illustrates this point, he sees mobility as a very useful and worthwhile thing to do, but only if the migrant returns to the sending country:

> 'Mobility also provides intercultural communication and dialog. I think at all costs one should realize such mobility but with the guarantee of his/her return and on a return sharing and applying the gained knowledge in his/her home society' [Turkish Interview_02].

However, the point that this paper makes is that cross border networks and connections do benefit the home or sending countries to some extent and are worth capturing within policy making on highly skilled migration. The following quote illustrates this point. This respondent is from Turkey but currently working in Germany. We asked whether migration was a positive thing for the sending and receiving countries.

> 'For Turkey, the sending country, for sure it has a positive effect, because I am here representing Turkey all over internationally and also in Germany, so it is like a good representation, but the negative thing is, I could also add some value to Turkey, for example to the economy of Turkey, as a qualified person. If I return, it would be completed... If I don't return, I believe I am still adding some value, because I am representing Turkey here. That is for sure, but the other part is missing. I can only support my country by representing them' [German Interview_04].

Why?

This section explores why or why not migrant science professionals seek to maintain contact with the sending country. In understanding what motivates individuals to engage in activities involving the sending country we can better understand how to harness these activities in ways that are useful and attractive to the individual and to the sending country.

Many of the respondents felt a responsibility to contribute to their home country in some cases this was linked to a sense of belonging and national pride, in others it was linked to repaying prior investments in education and training. As noted above it was common to seek to return to the sending country as a key way of 'giving something back'. The following sentiments were common:

> '...it is really very important for me that I should contribute more to my country' [Turkish Interview 04].

> 'I feel that it's very ethical and moralistic and a thing of strong values to go back and do your bit' [U18].

Many respondents who haven't returned or don't plan to return to the sending country express a willingness to maintain professional contact with their host country. As the following examples show these sentiments are linked to factors such as national pride and identity, feeling an obligation or responsibility to contribute and also feelings of guilt. The following respondent is from South Africa he worked in the US and then settled in the UK, he talks about the importance that he places on making a contribution to South Africa.

> 'I think I still have strong, well I was going to say benign, feelings for wanting to do something to help... I was very influenced by what we call the 'brain drain'. Do you have a brain gain? So, a reciprocity there and not just to take. There has been so much benefit to say the UK from people who've come here that it's only natural that a little bit, if not a lot more should go back to promoting the development of Science as such, and education generally within South Africa' [U12].

The following respondent talks about feeling connected to her country even though she does not plan to return, she feels an obligation to contribute to her country:

> '...that is my country and that is where my roots are and I think that I am in a position where I could possibly do things to help on a small level. I think, yes I do have an obligation to do that. I think people here have a lot more than many people in South Africa and that's something that I can't forget so' [U08].

Even though the following respondent is based in Germany, she is keen to disseminate her research in Turkey:

> 'Whenever I go back, I always try to give a talk in my hometown university and I will keep on doing that as long as I am academic on my research here, I have been welcome so far' [German Interview_09].

The following respondent feels proud to disseminate his research findings in his home country:

> ‘And it is very proudful to go to your own country and present there’ [German Interview_08].

A particularly strong theme amongst the South African cohort who was based longer-term in the UK was a feeling of guilt for having left South Africa. For many this motivates them to engage with South Africa and to seek to contribute from a distance. The following respondent is medically trained but pursuing a research career in the UK, she refers to media coverage on the subject of professional migration both in the sending and host country and articulates a pressure to contribute in one way or another. She goes on to discuss a sense of guilt because she has chosen to carry out research rather than to practise as a doctor and because she has left South Africa:

> ‘...yeah, you do feel horrendously guilty about it pretty much for years and years and years, I'm not free of it, definitely not. So part of the plan has to be helping South Africa’ [U09].

The following respondent discusses a sense of guilt or debt as a key motivational factor behind his efforts to contribute to South Africa:

> ‘Well I have tried, I have tried but as I’ve said it’s pretty much guilt. It’s debt, it’s justified so I can’t claim that I’ve done a lot for the country, I’ve certainly tried’ [U12].

Not all respondents actively sought to contribute to the sending country whilst based abroad. Many respondents intend to return to the sending country and anticipated that they would contribute upon return. The following early career researcher intends to return to South Africa following his PhD training and the completion of one or two postdoctoral positions, he anticipates that once he returns he will 'do his part':

> ‘...hopefully when I do go back, my contribution would outweigh my little blip being out of the country, that 10 to 15 years of being out of the country. So when I return to the country I'll be in my 30’s, and hopefully through my career in South Africa, should I get a career in South Africa, I can help and you know, do my part’ [U06].

Similarly, the following respondent is keen to return to Turkey seeing return as a key way to transfer the knowledge gained in Germany back to Turkey:

> ‘Yes, actually I have a one and a half years’ contract more and after this I want to stay maybe one and a half years more because I want to experience the real working life in Germany, but in the end I strictly want to go back to Turkey. I want to share what I learned in Germany to people who live in Turkey. This is actually one of the main aims of me’ [German Interview_13].

Some of the early career researchers based in the UK had considered contributing to South Africa but felt too junior to make a meaningful contribution.

> ‘I don’t feel like I’ve got enough to kind of give back yet, to go and start making links, it’s something that I see happening in 5 years time’ [U09].

A key issue for early career researchers was that they intended to establish their scientific careers outside of South Africa before contemplating returning. We asked the following respondent if she intended to return to South Africa:

> ‘Well that’s little bit of an open question still, I don’t know that I will return...I think if you want to develop contacts and establish yourself as a researcher you need to do that outside of South Africa and then once you’ve established yourself and you are known within the field and you can generate your own funding that is the moment that you can return’ [U16].

Although some of the early career researchers interviewed were open to the possibility of return, it is likely that many will continue to work outside of the sending country. Perhaps there is scope to target and better engage early career researchers and maximise the contributions that they could make to the sending country during the early career phase. There are two key issues here firstly researchers who wish or intend to contribute to the sending country may be unnecessarily delaying active engagement (in anticipation of return) and secondly that the more mundane and everyday contributions that early career researchers could make are perhaps being overlooked or overshadowed because 'making a contribution' is associated with doing something major or outstanding.

The following case study highlights key barriers that prevent professional migrants who have lived outside of the sending country in the long-term from making a contribution to the sending country. The following respondent has been living and working in the UK longer-term. He originally intended to come to the UK for a short-term scholarship and then to return to South Africa. However is political beliefs prevented him from returning during apartheid and his career progressed in the UK. He explains:

> ‘I felt alienated from South African society, I felt I won’t be comfortable here so it was cultural migration, I felt more comfortable in England’ [U11].

Although this respondent was initially going to stay in the UK for a short period and then return, political factors caused him to continue extending his stay during that time political issues prevented him from feeling like making a contribution or paying the country back for is training:

> ‘I still have a substantial feeling of guilt about the fact that I got to my present position from a South African made platform that I didn’t pay for and South Africa got no benefit from the investment that it made in training and preparing me. But I was too young to understand that...and then in a sense when the time came back to pay back which was when I was 25, I thought you want me to pay it back on your terms in a country that you’re governing in your particular way that I feel terribly uncomfortable with?’ [U11].

He later explains:

> ‘I wasn’t to know apartheid would eventually break down by which time I was 46 and completely established here’ [U11].

In the following quote the respondent explains that he built his career in England making it difficult to return or to transfer his qualifications, moreover when he went back to South Africa to visit the hospital that he trained in, he did not feel that he could make a useful contribution from the UK, he did not feel that he had anything to offer:

> ‘I was adopted by England at a young professional age I was adopted at professional birth so to speak, well certainly fostered by England and I never went back to live in my parental institution or my parental hospital so in fact I’m not even registered with the South African medical and dental council so I couldn’t work in South Africa. I used to go and visit the hospital and what-have-you but I recognised that I didn’t have anything extra to offer. They had people with my skills and qualifications’ [U11].

Nevertheless he now feels that he would be willing to contribute to South Africa. If there was a scheme through which he could help to develop the skills base he would like to get involved in that.

> ‘If having got back here someone said to me, would you be prepared to participate in some system of countries like Britain offering countries like South Africa, skills, you know, giving something back. The answer would be definitely, I would, I would like to do that, but in a very small way, in relation to hospital at South Africa, nothing particularly important, I think that’s what we really do have to do is to help places like South Africa build up their skill base but maybe that’s not what they need’ [U11].

Alternatively, a useful way of contributing to the sending country could be through conducting research that is relevant there rather than focusing on UK issues.

> ‘I think we should be constantly reminded of the fact that we can’t just live in an isolated environment here in Europe and that we’re all members of the human race and what’s going on in South Africa we should be thinking about and trying to do things like research into medical problems and disease, that are not particularly fashionable in the United Kingdom like tuberculosis, what have you, I think that’s the sort of thing that we, that we could do but that may sound a bit soft and wishy-washy...’ [U11].

Three key factors have prevented this respondent from contributing to the sending country, the first is a feeling of alienation associated with his opposition to the political regime, the second is associated with career stage and intentions to return and the third is associated with finding an appropriate way to contribute meaningfully.

How?

This section primarily draws from interviews with South African professionals in the UK and Turkish professionals in Germany; it explores ways in which the respondents interviewed engage with professionals and institutions in the sending country through research activities. The aim is to introduce some of the mechanisms that are currently engaged in order to contribute scientifically to sending countries. Key activities by which respondents engage with South Africa aside from return include networking, giving papers, teaching students and training doctoral candidates as well as conducting joint projects and seeking to apply for funding. The following section will introduce two case studies of researchers who appear active in South African and Turkish networks. The first is a senior academic who is well established, the second and third are career researchers who maintain links within the sending countries.

The first example is of a Professor who having migrated to the United States developed his scientific career in the UK; he has lived and worked in the UK for over 30 years. This respondent was keen to maintain links with institutions in South Africa but is also well regarded and central to key international networks within his field.

One way in which this Professor engages with South African scientists is by training doctoral candidates in his lab in the UK. He sees this as an important contribution but notes that this may compound brain drain issues as many students haven't returned to South Africa. He said that since the fall of apartheid he has tried to recruit candidates who are likely to return.

> ‘I’ve had more than 20 doctoral students here from South Africa. So I was probably contributing to emigration from South Africa because many of them, most of them didn’t go back and went on to careers in the States or elsewhere. Since the change over in South Africa I managed a policy where I would prefer to have people who might go back to South Africa. And I’ve had about, well a total of more than 20 now and 3 or 4 of them have returned’ [U12].

Aside from training doctoral candidates the Professor engages in joint projects with researchers in South Africa and is active within research networks. This has been made possible because his research interests are similar to research priorities in South Africa in the field of infectious diseases. This Professor has harnessed UK funding to develop research projects and to provide training within South Africa

> ‘I ran two workshops for the Wellcome Trust where we had people from all over Sub Saharan Africa, about 30 each time, coming [to South Africa] for a week or a 10 day course. I’ve organised various other activities there as well. Conferences and so on. I’ve gone back regularly at least once a year. And I’ll probably spend a little bit more time there after I retire.’

The links that this respondent has were primarily based on friendship networks that have been maintained since he trained in South Africa. These networks are bolstered by students and colleagues returning to South Africa and maintaining contact:

> ‘it’s personal networks then one thing leads to another so one of my African students has just gone back... he’s just arranging for me to come as an advisor’ [U12].

Aside from developing research directly associated with his own research interests this respondent has engaged in projects with a more social focus. He talks about an educational project that he has worked on to promote awareness of HIV and AIDS amongst children:

> ‘I’ve been involved in an AIDS education project for example... And I do in fact have daily contacts with people in South Africa’ [U12].

There are several factors that contribute to the nature of this respondent's collaboration. Firstly his research interests match those of active research groups in South Africa, secondly he is an important figure in his field attracting students and post-docs from South Africa and all over the world, his contacts in South Africa have been maintained through friendship networks as well as professional links, finally this respondent has been proactive in harnessing funding to develop training and projects in South Africa.

The next example is of a mid-career researcher working as a postdoctoral research fellow in the UK having spent four years working as a post-doc in the US. Again this respondent's research interests correspond to research priorities in South Africa. She maintains active links with her former PhD lab in South Africa. This respondent's collaborative activities are on a relatively small scale at the moment but this example usefully shows that researchers can maintain collaborative links with sending countries within earlier stages of their career.

Upon finishing her PhD in South Africa, this respondent's supervisor actively encouraged her to go to work in the US, using his networks and contacts to help her to find job opportunities, she explains:

> ‘I think its admirable of him to do that because I think he knows that while doing that he is probably going to lose someone he wants to keep. And in fact I still keep in touch with him and talk to him on a regular basis and every time I see him he tries to make me come back to South Africa. But I think he knows deep down that that’s the hard sell. But he definitely encouraged me and I'm very grateful to him for that’ [U08].

This respondent continues to keep in touch with colleagues and supervisors in South Africa. They have now informally developed a research project and this has led to a publication.

> ‘There's someone who was studying with me at the time who’s now a senior post-doc in the lab and we had an act of collaboration which resulted in publication. We have a new thing that we’re just starting up. He has a student working on it and when I have time I work on it. So it is an active project that’s well defined and the plan is to get some preliminary data and write for some funding for that. So I would say it's very much an act of collaboration but also a very friendly one’ [U08].

This collaboration is something that the research fellow is working on in her own time but as she explains there is a reciprocal benefit for her. In addition this respondent has been able to strengthen links between the lab in South Africa and that in the US. She maintains informal contact but anticipates that this could lead to the development of something more concrete in the future.

> ‘Actually so the collaboration that I have with the guys in South Africa also involves someone in the US. In fact the guy who got me over to the US in the first place. So he’s started his own lab and he’s involved in this collaboration too so that’s on a formal level but I do still have contact with various people that I post-doced with and who’ve now all gone off to start their lab so you know, there's no defined formal project apart from the one with the group in South Africa at the moment but you know there's always opportunities’ [U08].

This respondent is proactive in seeking to promote South African science and scientists:

> ‘I've tried to do what small things I can, so last year there was a student who was looking to come over here and, you know, just trying to point out to her these opportunities and sort of things you should do and just anything that I can do like that I try to do [U08].

Once again maintaining similar research interests with teams in South Africa is the key to the success of this collaboration. A combination of informal and formal working relationships and contexts combine to produce both concrete results and actions and to generate potential activities and ideas. The motivation of the individual to collaborate is also key, this respondent works of projects and ideas in her own time but she does anticipate that these activities will generate useful results in the future.

The following respondent left the sending country at a very junior stage and has build up his professional links with the country whilst working in the EU. This respondent studied to Masters level in Turkey before moving to Germany as a doctoral candidate. He now works as a post-doc within a German University.

The respondent maintains some links in Turkey and contemplates returning to Turkey at some point. His original plan to return however changed because of dual career issues; his wife was working on her PhD in Switzerland so he found work as a post-doc in order to live close to his wife. For now a number of potential opportunities in Germany and the US appear more attractive than returning to Turkey.

> 'I don't hold a position [in Turkey], but I have a couple of offers. At anytime I can go back and start work there, it is an assistant professorship, but at the moment I am still here I have like three more months of a contract and afterwards there are couple of possibilities, so one of them, is a pilot project here and if that comes off, I will get my own position. [I have had] an offer from Harvard university, maybe I will go to Harvard or maybe if I miss too much my country, I will go back to Turkey' [German Interview 10].

Although this respondent does not immediately plan to return to Turkey, he maintains links and networks there. A number of key activities; teaching, doctoral supervision and joint publications bolster professional networks in Turkey.

> 'Almost every year I go to Turkey for some summer schools to teach some students and I organise some schools and I really have like 2-3 PhD students in Turkey. I am co-supervisor of them. I am working with them. This year we published like 12 papers' [German Interview 10].

Turkey plays an important role in this respondent's working life in Germany. But it is important to note that he commonly combines travel to turkey with his leisure time and activities. This respondent has turned down a number of conferences in Turkey as an attempt to balance these activities with international networking further afield. He sees such activities as key to his career development.

> 'I would say, half of my work is now with Turkey…Whenever I go for holidays to Turkey, I go to find the physics department and give a talk and talk with different people, make networking and now I have like 7 offers from Turkey also. My relation with Turkey is much stronger now' [German Interview 10].

The case studies outlined above serve to introduce real life examples of networking and collaboration that may benefit the sending country but do not entail the permanent return of the highly skilled migrant.

Conclusions

This paper responds to developments in understanding the nature and impact of highly skilled migration by examining key EU policies for their potential to actively engage migrants themselves within scientific capacity building in their home country. The paper has introduced the theme of 'giving something back' that has emerged from interviews with South African and Turkish scientists who are working in the UK and Germany or who have returned to the sending country. It has explored what migrants themselves consider to be a useful contribution to the development of science research within the sending country, why migrants do or do not engage in collaborative activities and finally how collaboration works in practice.

Theories of highly skilled migration have begun to emphasise the capacity for the Diaspora to contribute to the sending country at a distance. Policy makers have also been keen to develop initiatives that can harness the activities of highly skilled migrants to support the economic development of their countries. In the context of expatriate scientists an emphasis on formally constituted Diaspora organisations has deflected attention away from the individual activities that form the basis of substantive contributions to the development of scientific capacity within the sending countries. I argue that the individual or micro level should form the starting point for our analysis. Understanding these activities will help to inform the direction of more formally constituted groups and might inform a better connection between what individuals themselves and sending countries seek to gain. Aside from formally constituted Diaspora groups other policy makers such as the European Commission could use information about how researchers currently engage with sending countries to hone their policies on international cooperation.

Looking specifically at EU initiatives designed to bring researchers from developing countries into the European Research Area, it is clear that international competition for highly skilled researchers is a key driver of policies in the area of migration. Although the European Commission is seeking to develop international cooperation initiatives that are tailored to level off capacity within the third county, attempts to attract the best researchers from these countries to work in the ERA remain immalleable. The strategy of EU institutions here appears to be to promote return and perhaps other forms of networking and knowledge exchange. At the same time the framework programmes accompanied by bilateral and bi-regional agreements aim to support further cooperation and capacity building within developing countries. There is scope for the European Commission to use ERA and Frame Work policies to further promote engagement of third country researchers in the sending countries.

Focusing in on the theme of 'giving something' back and the reported experiences of respondents within our sample, it is clear that national identities and ongoing connections with the sending country are the sources of affinity and feelings of belonging that do not cease when researchers move to work in another country. Many respondents maintained ongoing professional connections with the sending country and some articulated specific feelings associated with wanting to 'give something back'. For some this felt like a moral obligation and for others it was articulated in a more transactional sense for example in terms of the cost of education or training. The importance of guilt in motivating an intention to contribute to the sending country was a strong message coming out of

interviews with South African researchers in particular. The motivation to contribute to the scientific development of the sending country often reflected the context of the initial move and importantly the intention to return. Those respondents who did not intend to return were more likely to actively seek opportunities to contribute at a distance whilst those who intend to return anticipate that they will share their knowledge when they go back. For those seeking to engage the scientific Diaspora the latter group may be an important group to target, for many migrants an intention to return is not realised; helping individuals to maintain connections with the host country could prevent years from being 'lost' in anticipation of return.

Motivations and intentions to contribute also reflect the career stage of the individual. Many early career researchers interviewed within this study felt too junior to contribute, feeling that they didn't have much to offer to the sending country. Despite this many had engaged in disseminating their research through guest lectures and conferences, particularly the Turkish respondents for whom travel to the sending country was easier. In some cases this reflected a feeling that 'giving something' back entails making an outstanding or major contribution. Perhaps it would be useful to investigate the value of smaller scale and 'more every day' contributions such as writing a paper, giving guest lectures or using professional contacts to bring researchers together, and to communicate that back to scientists working abroad. Some respondents were unsure where their actions should be targeted and some discussed feeling arrogant, questioning whether the sending country needed what they had to offer. In this context formalised Diaspora groups or other organisations could play a role in advertising the kinds of activities that would usefully contribute to the sending country.

Within the case studies used to illustrate how 'giving something back' works in practice the role of a combination of professional and friendship relationships becomes clear. This should perhaps cause policy makers to think carefully about how close working relationships are established and maintained, and question the extent to which they can or should be formalised. Existing relationships are bolstered by concrete activities such as joint projects and publications. In the context of more established researchers, staff and student exchanges serve to maintain links with colleagues within the sending country and later to broaden international networks. The illustration above demonstrates that staff and student exchanges can promote the emigration of further human resources whilst at the same time cementing strategic relationships between professors and groups. Having researchers based in other countries can serve to maximise resources and provide access to important equipment and results. The example above of an active network between the UK, the US and South Africa illustrated the possibility of developing projects across borders and harnessing resources such as the time of graduate students or the availability of samples that can later be shared. In some instances the resources of the host country can be used to the benefit of the sending country for example through the provision of funding for training events.

A further factor that is central to ongoing collaboration and the development of concrete projects and activities is the field of research. Through the framework programmes and the opening up of the ERA internationally, the European Community is seeking to develop activities in areas of mutual interest to the EU and third countries. Moreover the process of accession to the EU generates a level of synergy with the policies of candidate

countries. Promoting research of mutual benefit to EU and developing countries would support active collaboration between individual researchers. A key issue for respondents whose area of expertise had shifted since migrating was that the professional connections that they had already established in the sending country remained informal friendship relationships and failed to generate concrete research activity. This may also have an impact on the ease with which researchers hear about opportunities for employment within the sending country that could facilitate return. In promoting synergy between EU and third countries however steps should be taken to ensure that research interests of benefit primarily to developing countries are not overlooked.

A central message from the interview data is that respondents consider return to be the most effective way of contributing to the sending country. It is important not to undermine efforts targeted at facilitating effective return and employment within the sending country. However this paper has shown that a range of activities do contribute to continued knowledge exchange and transfer. Such activities should be supported and promoted prior return and in the context of longer term stays within host countries.

References

Ackers, H.L. (2005), 'Moving People and Knowledge: Scientific Mobility in the European Union', International Migration, 43(5), 99-131.

Ackers, H.L. and Gill, B. (2008), 'Moving People and Knowledge: Scientific Mobility in an Enlarging European Union'. Cheltenham: Edward Elgar.

Africa Recruit (2006), 'Science and Technology for Africa', retrieved 19.01.2009 from: <http://africarecruit.com/diasporainscienceandtechnology>

Box, S. and Basri, E. (2008), 'The Global Competition for Talent: Mobility of the Highly Skilled'. Paris: OECD.

CAAST-Net (2009), 'The CAAST-Net Project', retrieved 20/01/2009 from: <http://www.caast-net.org/xwiki/bin/view/Main/>

CEC (2000), 'The Economic and Social Committee and the Committee of the Regions, Towards a European Research Area', Communication from the Commission, COM(2000) 6.

CEC (2001), 'A Mobility Strategy for the European Research Area', Communication from the Commission COM(2001) 331 final.

CEC (2003), 'Research, Candidate Country: A Shot in the Arm for Turkish R&D', DG Research Headlines, 27 January 2003, retrieved 20/01/2009 from: <http://ec.europa.eu/research/headlines/01-2003.html#07>

CEC (2007a), 'Green Paper The European Research Area: New Perspectives', COM(2007) 161 final.

CEC (2007b), '3 Western Balkans Countries and Turkey join EU Research Programme', Rapid Press Release, 13 June 2007, IP/07/816, retrieved 20/01/09 from: <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/07/816&format=HTML&aged=0&language=EN&guiLanguage=en>

CEC (2008a), 'Better Careers and More Mobility: A European Partnership for Researchers', Communication from the Commission COM(2008) 317 final.

CEC (2008b), 'A Strategic European Framework for International Science and Technology Cooperation', Communication from the Commission COM(2008) 588 final.

CEC (2008c), 'People', retrieved 30/01/2009 from: <http://cordis.europa.eu/fp7/people/home_en.html>

CEC and DST (2007), 'Report on Progress in the Implementation of the Agreement on Scientific and Technological Cooperation between the European Community and the Republic of South Africa', retrieved 20/01/2009 from: <http://ec.europa.eu/research/iscp/pdf/sa-eu_st_implementation_report_jc_oct_2007_en.pdf>

Cervantes, M. and Guellec, D. (2002), 'The Brain Drain: Old Myths, New Realities', OECD Observer, Jan 2002 (230), 40-43.

Dayton-Johnson, J. et al. (2007), 'Policy Coherence for Development: Migration and Developing Countries'. Paris: OECD.

De Hasse, H. (2006), 'Engaging Diasporas – How Government and Development Agencies Can Support Diaspora Involvement in the Development of Origin Countries', IMI, in cooperation with Oxfam-Novib, International Migration Institute, University of Oxford.

DG Research (2007), 'A New Approach to International S&T Cooperation in the EU's 7th Framework Programme (2007-2013)'. Luxembourg: European Communities.

Docquier, F. and Rapoport, H. (2004), 'Skilled Migration: the Perspective of Developing Countries', World Bank Policy Research Working Paper Series, Number 3382, Washington: World Bank.

European Council (1999), 'Presidency Conclusions', Helsinki European Summit, 10 and 11 December 1999, 00300/1/99.

Karatayli, I. (2007), 'ERAWATCH Research Inventory Report for: Turkey'. Brussels: Cordis, ERAWATCH, retrieved 20/01/09 from: <http://cordis.europa.eu/erawatch/index.cfm?fuseaction=ri.content&topicID=4&countryCode=TR>

King, R. (2002), 'Towards a New Map of European Migration', International Journal of Population Geography 8(2), 89-106.

Lieff Benderly, B. (2007), 'A Tunnel to Atlanta', Science Careers from the Journal Science, 4 May, 2007, retrieved 20.01.2009 from: <http://sciencecareers.sciencemag.org/career_development/previous_issues/articles/2007_05_04/caredit_a0700063>

Lowell, L. and Gerova, S.G. (2004), 'Diasporas and Economic Development: State of Knowledge', Institute for the Study of International Migration, Georgetown University, paper prepared for the World Bank.

Mahroum, S. (2001), 'Europe and the Immigration of Highly Skilled Labour', International Migration 39(5), 27-43.

Meyer, J-B. (2001), 'Network Approach versus Brian Drain: Lessons from the Diaspora', International Migration 39(5), 91-110.

Meyer, J-B. and Brown, M. (1999), 'Scientific Diasporas: A New Approach to the Brain Drain', Conference Paper, World Conference on Science UNESCO – ICSU, Budapest, Hungary, 26 June - 1 July 1999, retrieved 19.01.2009 from: <http://www.unesco.org/most/meyer.htm>

Mouton, J. et al. (2007), 'Scientific Mobility and the African Diaspora', Researching Inequality Through Science and Technology (ResIST), Project Deliverable # 4, April 2007, retrieved 19.01.2009 from: <http://www.resist-research.net>

Oliver, E.A. (2007), 'Gender Equality and Career Progression in Science: Managing Work and Family Life on Fixed Term Contracts', Thesis, (PhD), University of Leeds.

Page, J. and Plaza, S. (2006), 'Migration Remittances and Development: A Review of Global Evidence', Journal of African Economies, supplement: African Economic Research Consortium: Plenary Session, December 2004 and May 2005, 15, 245-336.

Senguin, B. et al. (2006), 'Scientific Diasporas', Science, 16 June 2006 (3120), 1602-1603.

Tanyildiz, Z. E. (2007), 'Do Networks Affect the Ethnic Composition of Science and Engineering Research Laboratories?,' Conference Paper, Annual Meeting of the Midwest Political Science Association, Palmer House Hotel, Chicago,12-15 April, 2007. Retrieved 19/01/2009 from: <http://www.allacademic.com//meta/p_mla_apa_research_citation/1/9/8/5/7/pages198579/p198579-1.php>

THE (2006), 'Commissioner Potocnik on first official visit to Turkey', The Times Higher Education Supplement 8 September, 2006, retrieved 20/01/09 from: <http://www.timeshighereducation.co.uk/story.asp?storyCode=205195&sectioncode=26>

Williams, A.M. et al. (2004), 'International Labour Mobility and Uneven Regional Development in Europe: Human Capital, Knowledge and Entrepreneurship', European Urban and Regional Studies 11(1), 27-46.

Official Documents

Council Decision of 10 November 1997 Concluding the Agreement on Scientific and Technological Cooperation between the European Community and the Republic of South Africa, OJ L 313, 15/11/1997: 25.

Decision No 1982/2006/EC of the European Parliament and of the Council of 18 December 2006 Concerning the Seventh Framework Programme of the European Community for Research, Technological Development and Demonstration Activities (2007-2013), L 412, 30/12/2006:1-41.

Council Directive 2005/71/EC of 12 October 2005 on a Specific Procedure for Admitting Third-Country Nationals for the Purposes of Scientific Research: OJ L 289, 3/11/ 2005: 15-22.

Council Recommendation of 12 October 2005 to Facilitate the Admission of Third-Country Nationals to Carry out Scientific Research in the European Community: OJ L 289: 26-28.

Recommendation of the European Parliament and of the Council of 28 September 2005 to facilitate the Issue by the Member States of Uniform Short-stay Visas for Researchers from Third Countries Travelling Within the Community for the Purpose of Carrying out Scientific Research: OJ L 289, 3.11.2005: 23-25.