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The Diaspora Option: A viable solution to the Brain Drain?

Brain Drain

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The Diaspora Option.

A viable solution to the Brain Drain ?

A dissertation submitted in fulfillment of the requirement for the **Masters**
degree in Industrial Sociology.

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ABSTRACT :

The phenomenon of skills mobility has become quite a topical issue, not just in South Africa, but worldwide. The reason for this is that in today's knowledge and skills-based economy the loss of highly qualified human resources is a critical issue for any country and especially for developing countries. Strategies have been implemented during the last three decades to counteract the brain drain, but these have not been very successful. A new and promising strategy is now emerging, this is referred to as the "diaspora option". The diaspora option seeks to mobilize highly skilled expatriates of a country to contribute to the social and economic advancement of their country of origin by finding ways of setting up links and connections between these highly skilled expatriates and the country of origin. The distinguishing feature of the diaspora option is that expatriates don't have to return to the country of origin, they can stay in the host country, but contribute their skills and knowledge to their home country from wherever they are in the world. The diaspora option is quite a recent phenomenon and no systematic research has been done on the number of countries that have actually gone the diaspora route. The aim of this project was to identify and study the experiences of countries that have set up scientific/intellectual diaspora networks and to assess the success of the diaspora option. Through systematic and rigorous searches on the Internet 35 networks were identified. However, because not all of them could strictly be classified as scientific/intellectual diaspora networks, only twelve networks were chosen for analysis. After careful investigation of the information available on these networks, it is concluded that the diaspora option, although not without potential pitfalls, is indeed a viable solution to the brain drain.

Introduction

This paper is concerned with the brain drain phenomenon. The brain drain has enjoyed much attention internationally in the last few decades, but more so in South Africa in recent times. A number of people, from the media to politicians have expressed their concern about the brain drain or the “chicken run” as it has been called. An investigation of South Africa’s migratory data shows that emigration is not a recent phenomenon, South Africans have for a long time left South African borders in search of “greener pastures”. However, with the reintegration of South Africa, the emigration of highly skilled people has become a critical issue. This reintegration into the world economy represents several challenges in terms of productivity, innovation and international competition. Many theorists have argued that highly skilled researchers and technologists play a crucial role in any nation’s drive for technological innovation and its competitiveness on the world market. South Africa can thus not afford to lose its highly skilled human resources at a time when it faces major economic challenges.

Countries have employed various strategies and policies in response to the brain drain problem. These range from taxation to repatriation policies. These policies have not however been very successful and many nations in the last decade have turned to an alternative policy. The latter is referred to as the “diaspora option”. This policy is an attempt to mobilize a country’s highly skilled diaspora and to get them to contribute in some way to their country of origin’s economic and social development without necessarily returning home. South Africa has also implemented the diaspora option through the creation of the South African Network of Skills Abroad.

The main objective of this paper is thus to critically analyze the diaspora option in terms of its efficacy and success. In order to do this; it was decided to study the experiences of other countries that have employed the diaspora option.

Before one can however begin to look at diaspora networks, one must have an understanding of why the need for this kind of initiative arose. I will thus study diaspora networks within the broader context of migration and specifically the brain drain phenomenon. Since this paper is mainly concerned with diaspora networks as a response to the brain drain phenomenon, it is necessary to explore these concepts in some detail. This will be done in the theoretical framework of this paper.

I have been working as a research intern on the South African Network of Skills Abroad(SANSA) project for the last eleven months. The aim of this project is to link highly skilled expatriates to their counterparts in South Africa and to encourage them to in some way get involved in South Africa's development process without returning to South Africa. My involvement in the SANSA project is what inspired me to conduct this study on intellectual/scientific diaspora networks. I believe that SANSA can learn a lot from the experiences of other countries and that it will give us valuable insight into the best ways of managing a diaspora network as well as the possible pitfalls associated with the diaspora option.

The first step in going about this study was to identify the number of countries that have gone the diaspora network route. My supervisor was extremely helpful in this regard, because he was involved in setting up a similar network in Colombia he had an idea of which countries have set up diaspora networks. This gave me a base from which to start working. The diaspora option is quite a recent phenomenon which meant that not much

literature on these diaspora networks was available. This in many ways shaped my methodology. I decided that the only way to go about finding information on these networks was to "surf the net". I thus embarked on an extensive search for these networks on the Internet. After several months of intensive searches on the Internet, I managed to identify 35 networks and associations of highly skilled expatriate researchers and scientists.

The next step was to try and get into contact with those individuals who were involved in the construction and management of these networks in order to get a better idea of how these networks work. This was done via e-mail.

The literature on international migration argues that migration is closely tied up with the socio-political and economic conditions in a particular country. These can serve as motivating factors in the decision of highly skilled individuals to leave their country of origin, but also the decision to return. However in order to get these individuals to return the economic and socio-political conditions have to be favorable in order to attract these individuals back to their home country. At the same time, these individuals play a critical role in the economic and technological advancement of their country of origin. I will argue that the repatriation and diaspora options don't have to be mutually exclusive. Through the diaspora option highly skilled expatriates can volunteer their skills and technological know-how to their country of origin without returning home. Expatriate scientists and technologists in collaboration with their counterparts at home can play a major role in stimulating innovation and technological advancement to such a degree where it could make conditions at home more favorable to the return of highly skilled expatriates. My study of diaspora networks will show how the diaspora option can

facilitate the above-mentioned collaboration and scientific exchanges between expatriate scientists and researchers and those at home.

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Theoretical Framework

a) BRAIN DRAIN

Defining Brain Drain:

The concept of brain drain first emerged in the 1960's when it was used to describe the migration of British intellectuals and scientists to the United States (Gaillard and Gaillard:1997:201). The most basic definition of brain drain is the "permanent emigration of qualified persons" (Straubhaar:1998:4). However since its introduction in the 1960's the concept of brain drain has enjoyed much attention and many attempts have been made to redefine the concept. Brain drain according to the United Nation's definition is "one-way movement of highly skilled people from developing countries to the developed countries that only benefits the industrialized (host) countries" (Gaillard and Gaillard:1997:195). This definition has been criticized for being too uni-vocal. The concept of brain drain has many facets to it that this definition simply does not incorporate.

The brain drain concept is not only restricted to the movement of highly skilled people, but can also be used to refer to the migration of students and intellectuals who leave their home country in search of better study opportunities abroad (Gaillard and Gaillard:1997). According to Gaillard and Gaillard this concept can also be applied to the migration of scientific and technical personnel into non-scientific sectors (internal brain drain) (Gaillard and Gaillard:1997).

In South Africa "brain drain" was used in the early 1990's, after the inauguration of the democratic government, to describe the movement of highly qualified union officials into

government. The United Nation's definition can also be misleading in that it portrays brain drain as a movement which only occurs between developing and developed countries. Highly skilled people also move between regions in a specific country for various reasons e.g. education, economic and or political reasons. The article by Mda (1995) about the movement of Kwazulu-Natal professionals to Gauteng in search of better career advancement illustrates this point. Articles such as those written by Leistner (1993) and Muller (1991) on the loss of highly skilled professionals from other African countries such as Lesotho, Swaziland, Zimbabwe and Uganda to South Africa show that brain drain occurs not only between developing and developed countries, but also between developing countries. Brain drain, therefore is at the least a vague concept with a number of dimensions to it.

The Brain Drain Debate:

The debate concerning the brain drain phenomenon has historically been between two perspectives; the internationalist perspective and the nationalist perspective. The first is based on global market theories and argues that brains will go where economic returns will be optimized. Theorists like Kindelberger have argued that the movement from developed to developing countries is mediated by "market mechanisms which work to allocate human resources more efficiently, the brain drain is thus a "natural" phenomenon. The nationalist perspective on the other hand holds the complete opposite view. According to theorists like Baghwatti, countries don't occupy the same position in the global system and "expertise is not evenly distributed". The only countries that benefit from the movement of highly skilled professionals from the South to the North, are the industrialized countries of the North.

The nationalist perspective is closely related to the arguments put forward by dependency theorists like Gunder Frank. According to these theorists the global system is stratified into center and periphery countries. The industrialized countries, those at the center of the global system, developed at the expense of developing countries, those at the periphery, as a result of historical processes such as colonialism and imperialism (Webster:1984).

According to Choi, this stratification is mirrored in the hierarchical structure of the international scientific community. Industrialized countries such as the United States are at the center of scientific knowledge production while developing countries, because they lack the infrastructure and resources necessary for scientific knowledge production and distribution simply can not compete (Choi:1995:8). This perpetuates the uneven, hierarchical nature of the global system. In this context, where developing countries are already at a disadvantage, the movement of highly skilled researchers and technologists is particularly worrying for developing countries.

However theorists like the ones discussed above, have tended to exaggerate the effects of the brain drain on the sending country. According to Pedersen and Lee this presentation of the brain drain as a win/lose situation between developed and developing countries is a misconception, because it fails to take into consideration the potential benefits that the movement of highly skilled people to industrialized countries can have for developing countries (1997:1).

When scientists and technologists leave their home country to go and study or work in an industrialized country, they get the opportunity to acquire knowledge and expertise which they might not have gained had they remained at home. They also establish knowledge and information networks in the host country. All these represent a great potential resource for the country of origin.

This is where the diaspora option is such a valuable strategy in counteracting the brain drain. The diaspora option allows the country of origin to tap into these potential resources mentioned above. It allows expatriate researchers and scientists to contribute the knowledge and expertise that they gained through their experiences in the host country to the economic and social development of their country of origin. It allows the home country access to the knowledge-networks that the expatriate forms part of in the host country. Furthermore, it also allows for the transfer of technology and ideas from industrialized to developing countries.

According to Pedersen and Lee, the "brain drain" presents potential benefits for all the interested parties. "If graduates who remain abroad create a loss of manpower for the sending countries, the receiving country faces a transfer of technology problem through the transfer of ideas with the expatriate as the vehicle of transmission" (Pedersen and Lee:1997:3). The way in which the brain drain has traditionally been presented as a gain for the receiving country at the expense of the sending country, is thus an oversimplification of the issue.

But, Why do Highly Qualified People Migrate: Push and Pull Factors

Many scholars have argued that economic, cultural and socio-political factors play a major role in the migration of highly skilled people. Choi in her study of 46 Asian scholars in the United States found that educational opportunities and the research environment in the United States were cited as the main motivation for Asian scholars' decision to study and work in the United States (1995:22). Other factors include the political situation at home at the time they left, financial support in the form of scholarships as well as personal and cultural factors.

These correspond with the push factors identified by Lachmansingh in his explanation of the brain drain phenomenon in Guyana. He identifies poor working and living conditions, unmet professional needs e.g. further education, alienation and discrimination, politics and the influence of others e.g. family as the main motivating factors behind the migration of highly qualified individuals from Guyana.

Countries being faced with the loss of highly skilled human resources have employed various strategies to counteract the brain drain by addressing the push and pull factors.

These include:

- a) **Taxation** which was a popular policy during the second part of the 1970's and the first part of the 1980's. Taxation in theory could take two forms; either taxing the individual emigrant or the intended host country. However, this policy was never implemented.
- b) **Regulation** through international norms can be used to inhibit emigration between countries. This policy, initiated by the United Nations, is based on agreements between developed countries and developing countries by which developed countries agree not to entice highly skilled people from developing countries to emigrate to their countries.
- c) **Conservation/Restrictive** policies aimed at delaying emigration for example adding extra years to medical students' training as proposed by the South African Minister of Health (Cohen, 1996/97).

These policies were formulated in the hope of counteracting the brain drain, but they were not very successful. Alternative policies are thus needed to recoup or counter the brain drain phenomenon. Two alternatives exist: the repatriation of expatriates (return option) or remote mobilization (diaspora option).

Repatriation refers to physically relocating expatriates to their country of origin (Cohen, 1996/97). Even though this is a worthwhile policy, it certainly has its limitations. One of these is that it is very costly to repatriate skilled labour. Reasons for this is the need to offer comparable salaries and up to date technological resources (Meyer, 1996).

Not only is the repatriation strategy costly, but more importantly, the expatriate has usually established certain links and forms part of particular knowledge networks in the host country. Repatriation only allows for the return of the expatriate and not the knowledge networks that he/she forms part of.

An alternative to repatriation is utilizing the intellectual diaspora of any given country. As was argued before, the diaspora option is a potentially effective strategy of dealing with the brain drain phenomenon.

b) Diaspora

The term diaspora has its origins in the Greek language, it is derived from the Greek verb *speiro* which means to sow and the preposition *dia* which means over (Cohen:1997:9).

The term diaspora usually evokes images of the Jewish people and their persecution that resulted in them being scattered all over the world. In fact the Oxford dictionary defines diaspora as “the settling of the Jews among various non-Jewish communities after they had been exiled (1989:331).

However the diaspora experience is not unique to the Jewish people. Many nations have for decades for various reasons been subjected to mass migrations, leaving their home country to settle in a foreign country. Cohen in his book on global diasporas outlines a typology of diasporas which consists of victim, labour, trade, imperial and cultural diasporas (Cohen:1997).

The first of these, victim diasporas are characterized by mass migration, forcible dispersal, exploitation and oppression. The selling of Africans into slavery is a typical example of a victim diaspora. The Jewish and the Armenian diasporas also constitute victim diasporas.

The second form of diaspora in Cohen's typology, labour diasporas, usually occurs when great numbers of people leave their home country to settle in another country in search of employment. Indentured labourers from India who left India to work in countries like Kenya, Uganda and South Africa constitute a labour diaspora. This system was different from slavery in that indentured laborers could not be bought or sold, they got a basic wage and free accommodation and after five to seven years were free to return to their home country, in some cases their return passage was paid for.

Trade diasporas are defined as "networks of proactive merchants who transport, buy and sell their goods over long distances. The Chinese traders are typical examples of trade diasporas. Imperial diasporas result from "the settlement of colonial or military purposes by one power" (Cohen:1997:67). In this case, settlement is not only encouraged by the state, but is actually state-sponsored. The settlement of the British in countries like Kenya, South Africa and Australia are typical examples of imperial diasporas.

Cultural diasporas are made up of four elements; "cultural retention or affirmation of some kind of identity, an interest in returning home, shared cultural expressions and social conduct and popular attitude. The Caribbean people are highlighted by Cohen as an example of a cultural diaspora.

Although the diasporas discussed in the above-mentioned typology have different shapes and occurred during different historical periods, they share some common features which make them diasporas. Cohen identifies a number of features which any settlement of people in a foreign country has to possess in order to be called a diaspora. These include; “a dispersion of a great number of people from their home country to two or more countries, the retaining of a collective memory, myth of vision of their original homeland, a refusal to be assimilated into the culture of the host country, a desire to eventually return home, a commitment to the maintenance and restoration of the original homeland, a strong ethnic group consciousness and a sense of empathy and solidarity with co-ethnic members in other countries of settlement (Cohen:1997:26).

When compared to Cohen’s typology and specifically his characteristics of a diaspora, the experiences studied here, do not really fit in anywhere. The only characteristic that I can say with some certainty, they have in common with Cohen’s typology, is the dispersal element. It is beyond the scope of the present project to study whether or not the other characteristics outlined by Cohen are present in the sample under investigation.

However, I would like to argue that Cohen’s typology is limited historically since it does not capture modern day settlement or migration of people from their home country to foreign countries. As was argued earlier, migration is not a static, unchanging phenomenon, but it changes in response to changing economic and socio-political conditions. Cohen’s typology, does not include more recent diasporas created by scientific and intellectual migrations. These could be comparable to some extent to his labour diasporas, however the nature of the work has changed although the motivating factors behind the movement/migration, i.e. the pursuit of better employment opportunities and improved living standards, are still the same.

In the case of the diaspora option studied here, the social dimensions one needs to consider are diasporas and networks. In order to understand what is at stake in this study, the concept of networks need to be discussed.

c) Networks

Network theories incorporate a number of different concepts; actors, linkages, exchanges, information exchanges, trust, etc. Networks are defined as “a regular set of contacts or similar social connections among individuals or groups” (Granovetter and Swedberg:1992:9).The concept of a network is used extensively in the new economic sociology which stands in stark contrast to neo-classical economic theories in its explanation of economic action.

Neo-classical economics argue that economic action is shaped and determined by logical and rational actors that are driven by self-interest and the conditions of the market.

Market conditions largely determine what economic transactions actors will engage in and the ultimate goal is to maximize efficiency and profits. Socio-economic theories on the other hand argue that economic action is socially constructed, it can not be explained by individual motives, it is embedded in ongoing networks of personal relations rather than carried out by atomized actors (Granovetter:1990:96).

Network theories further argue that because economic transactions are embedded in personal relations, trust between different actors governs the exchanges which take place between actors, in fact networks act to generate understanding and trust (Rosenbaum:1990).

Another element of network theory is the sharing of information between different actors. Economic action takes place because there is a constant flow of information between actors. In order for action to be generated, actors have to have sufficient information regarding the potential for action.

Networks take various forms from more personal, social networks, familial/kinship networks and institutional networks to technological systems (Murdock:1995). Social networks consist of a complex set of linkages between different actors and different exchanges that take place between them. A number of questions need to be taken into consideration; what motivates different actors to enter into these relationships, what lies behind the creation of a specific network, what mediates and facilitates the linkages between actors and the exchanges which take place between them, how do these exchanges take place?

According to Murdoch (1995), networks not only consist of human elements, but also incorporate non-human elements. He argues that for any “social order to be effective and stable, it has to spread across space and time, for left to their own devices, human actions and words do not spread far at all” (Law in Murdock:1995:747). This is where the concept of intermediaries comes in. Intermediaries consist of texts, technical artifacts, human beings and money (Callon in Murdock:1995:747). These intermediaries serve to “cement” the linkages between actors in the networks which they form part of (ibid).

This is what highlights one of the fundamental weaknesses of economic sociology, it does not go beyond the embeddedness concept in explaining action and exchanges between actors. It does not explain the nature of the social relationships that economic action is embedded in or the dynamics behind them. Economic Sociology does not explain why

actors enter into specific social relationships or the motives behind the construction of particular networks. The intermediary concept is useful in explaining what facilitates exchanges and linkages between actors. Actors enter into specific relationships with other actors, because they stand to benefit something from this particular interaction.

In the specific networks under consideration in this paper, intellectual or scientific diaspora networks, network administrators initially appeal to patriotism or actors' loyalty and their concern for their country of origin's economic and social development to elicit co-operation from potential network members. However this is not enough to sustain the network or to generate activities in the network. Network members need to feel that they stand to gain something from their involvement in the network.

Being part of a network consisting of highly skilled scientists and technologists offers the possibility of collaborative research projects which will bring great recognition for individual actors. Actors will enter into relationships with other actors who will offer the best possibility of collaborative research of great quality and ultimately recognition. In these particular networks this is one of the intermediaries which "cement" the linkages between different actors in the networks and facilitate exchanges between them. Others may include the sharing of information about the latest technological advancements in particular countries and the possibility to present one's work at international conferences, etc.

At this point we need to touch on another characteristic of networks which has not been discussed yet. Networks are not confined to a particular space or geographical location, but can spread across geographical space or time. This is particularly true of the networks studied in this project. One of the characteristics of intellectual diaspora networks is that

actors are spread across different countries and regions, from there the term *diaspora* networks. In this instance, the Internet plays an important role in making connection and information exchanges between actors possible. Although the Internet does not determine connectivity or exchanges, it certainly plays a major role in facilitating it. Exchanges would probably still have occurred in the absence of the Internet, but it certainly makes connectivity and the sharing of information a lot easier.

The SANSA project which I have been involved in for the last year, is an example of an intellectual diaspora network which aims to locate highly skilled South Africans living abroad and to get them to volunteer their skills towards the economic and social development of South Africa.

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Methodology

The methodology of any research project is shaped and determined by the purpose of the research and the unit of analysis (what is being studied) (Mouton:1996:39). This is certainly true in this case. The creation of intellectual diaspora networks is quite a recent phenomenon; in fact the majority of the networks studied were created in the early 1990's. This meant that not much literature is available on these specific networks and certainly not in South Africa. This in many ways shaped the methods that I used to gather information.

Methods Used:

The Internet plays a vital role in facilitating connectivity and communication between actors in these specific networks. This was thus a logical starting point from which to conduct my search for information regarding these intellectual diaspora networks. Before I started working on the SANSA project, I had no idea that these networks even existed and had no idea of which countries had actually set up intellectual diaspora networks.

My supervisor who was involved in the creation of the Colombian Network of Scientists and Engineers Abroad proved an invaluable source of information and guidance. He gave me an idea of the countries which have set up these networks as well as a list of individuals that were involved in setting them up and managing them. Once I had an idea of what to look for I started with very intensive and extensive searches on the Internet. These consisted of a combination of different keywords, combining the major concepts like expatriate, networks, scientific, diaspora, scientists, researchers as well as the names of countries that I thought could possibly have an intellectual diaspora network. For the

benefit of the reader I included a table containing a list of the searches conducted so that the reader can get a better idea of what these searches entailed. (*See table1*). These searches were conducted over a time-span of six months and yielded very interesting results.

Table1:

<i>Search Engine</i>	<i>Date</i>	<i>Keyword Used</i>
Infoseek	04/08/1998	TOKTEN, UNESCO, scientific migration, migration of highly skilled people, Global Scientific Community of Latin America
Lycos	12/08/1998	scientific networks in Latin America, migration of highly skilled human resources, networks of expatriate scientists, international organization for migration, networks of qualified expatriate nationals
Yahoo	12/08/1998	diaspora academic networks, scientific networks, academic networks
Looksmart	13/08/1998	academic networks
Netscape	17/08/1998	Hungarian Scientific Network of expatriates
Internet Explorer	19/08/1998	Scientific Expatriate Networks
Alta Vista	19/08/1998	Expatriate Networks
Infoseek	19/08/1998	Brain Gain Network
Netscape	24/08/1998	Red Expatriados Chile, Red Scientificos-Chile
Yahoo EnEspanol	25/08/1998	Red Scientificos Brazil
Netscape	27/08/1998	Reseau Scientifiques Senegal Nationaux
Looksmart	30/08/1998	Research Networks of Expatriates
Netscape	25/09/1998	Chinese Networks of Highly Skilled Expatriates
Yahoo	25/09/1998	Chinese Diaspora

Alta Vista	25/09/1998	Chinese Scientists and Technologists Abroad, Chinese Network of Scientists Abroad, Irish Research Scientists Association, Network of Chinese Scientists and Technologists Abroad, Chinese Intellectual Diaspora
UK plus	13/10/1998	Network of Taiwanese Scientists and Scholars Abroad
Netscape	13/1/1998	Network of Taiwanese Scientists and Scholars Abroad
Netscape	14/10/1998	same as above
Infoseek	14/10/1998	same as above
Excite	14/10/1998	same as above
Alta Vista	14/10/1998	networks of scientists and scholars abroad
Alta Vista	14/10/1998	networks of African scientists and professionals abroad
Alta Vista	14/10/1998	networks of Ethiopian scientists and engineers abroad, network of expatriate Nigerian scientists and engineers abroad
Netscape	14/10/1998	network of Korean scientists and scholars abroad, network of highly skilled Koreans abroad
Alta Vista	14/10/1998	network of highly skilled Kenyans abroad, network of Kenyan scientists and scholars abroad, intellectual and scientific diaspora
Infoseek	14/10/1998	network of highly skilled africans abroad
Lycos	14/10/1998	networks of highly skilled africans abroad
Netscape	14/10/1998	networks of scientists and engineers abroad, networks of Japanese scientists and engineers abroad
Alta Vista	15/10/1998	networks of Taiwanese expatriates, networks of

		highly skilled Russians abroad, expatriate network, reverse brain drain network
Lycos	15/10/1998	recovering highly skilled manpower, transfer of knowledge through Taiwanese expatriates
Infoseek	15/10/1998	networks of expatriate scientists and engineers abroad
Alta Vista	15/10/1998	recovering highly skilled manpower from abroad
Netscape	16/10/1998	committee on the international migration of talent
Netscape	05/11/1998	networks of scientists and technicians abroad
Alta Vista	05/11/1998	African network of scientists and technicians abroad, network of Tunisian scientists and technologists abroad, network of Brazilian scientists and technologists abroad
Alta Vista	23/11/1998	network of Mexican scientists, researchers and technologists abroad
Netscape	23/11/1998	network of Mexican scientists, researchers and scholars abroad
Alta Vista	14/12/1998	Moroccan Association of researchers and scientists abroad
Alta Vista	14/12/1998	Association of Kenyan scientists and scholars abroad
Alta Vista	05/01/1999	organization of Kenyans abroad, Global Russian network
Netscape	06/01/1999	Global Russian Network
Netscape	09/02/1999	Association of Israeli Scientists and researchers abroad
UK plus	10/02/1999	Association of Israeli Scientists and Technologists Abroad

The above-mentioned searches were combined with a short request for more information to a list of 21 contacts received from my supervisor. These people were all involved in the setting up and management of intellectual diaspora networks in different countries, mostly Latin American countries like Uruguay, Argentina, Peru, etc. I contacted these people via e-mail. Since Spanish is the language spoken in most of these Latin American countries, e-mail messages were sent in both English and Spanish. My supervisor again, was very useful, because he speaks Spanish and I don't, he wrote the e-mails in Spanish to the Spanish speaking individuals on the list.

The results yielded by the Internet searches usually included a website of the specific intellectual diaspora network as well as an e-mail address of the network administrators. This allowed me to gain more information about the network, but also served as a means of establishing contact. E-mails containing a short list of questions about the network and the network members were sent to for example the Uruguyan Network, the Polish Scientists Abroad Network, the Croatian Network, the Iranian Scholars' Scientific Network, the Transfer of Knowledge through Expatriate Nationals (TOKTEN) programme, Association of Kenyans Abroad, Argentine Network, the Interface of NRI Scientists and Technologists Center, the Brain Gain Network of the Philippines, the Association of Nigerians Abroad, etc.

The nature of the research project determined the types of methods I could use to gather information. Because this is the first study of its kind conducted here (study of intellectual diaspora networks); I could not really rely on existing sources to gather information.

Also, because these networks are spread across the world and the Internet is the main tool

for connection and communication, I could not really make use of conventional methods of data collection like interviewing, group discussions or surveys.

I did however get a chance to make use of more conventional methods like in-depth interviewing and more informal discussions when a very prominent professor who was involved in the creation of the Colombian Network of Scientists and Researchers Abroad came to visit our unit. I conducted an in-depth interview with him which lasted for about one and a half hours as well as several informal discussions. Through this I gathered valuable information about the Colombian Network.

I was also involved in the sending out of a questionnaire to the potential members of the South African Network of Skills Abroad. We send out 25000 questionnaires to highly skilled South Africans living abroad. Their contact details were obtained from the alumni lists of 11 South African universities and 4 technikons as well as the Foundation for Research Development, the Human Science Research Council and South African Embassies/High Commissions. As members returned completed questionnaires, myself and the other members of the team were responsible for capturing the information received. In some cases we had to manipulate the data to fit certain pre-set categories for the purpose of standardizing the data. Part of my duties also included the analysis of the data we received from the network members. I was thus heavily involved in the preliminary "fieldwork" that was done for the setting up of the South African Network of Skills Abroad.

Although I did manage to get information on 35 different types of networks, not all of them intellectual diaspora networks, the information discovered for each of them vary.

Some of these networks have websites that contain a whole lot of information, whereas others don't have that much information. I thus excluded some of these networks from the analysis on the basis that they can not strictly be classified as intellectual/scientific diaspora networks and the fact that some of the websites contained so little information, it was difficult to get an idea of the nature and dynamics of the network and the network members.

I thus decided to focus on 12 of these networks for analysis as they fit the description of intellectual/scientific diasporas more closely. Five of these networks, SANSA, Red Caldas (the Colombian Network), the Tunisian Scientific Consortium, the Brain Gain Network of the Philippines and the Arab Scientists and Technologists Abroad (ASTA) will be used as case studies of typical intellectual/scientific diaspora networks. I decided to focus on these networks because I was involved in the setting up of the SANSA network, have worked closely with one of the main initiators of the Red Caldas network and because the websites of the other three networks contained a lot of interesting and fascinating information which gave me more insight into how these networks operate.

Methodological Issues:

Language:

Language was definitely a major obstacle in doing this project. As mentioned before the networks under consideration are spread across the globe with a number of them in Latin American countries. This meant that a quite a few of the websites were in foreign languages like Spanish, French, Hungarian, Chinese and Russian. My supervisor who speaks French and Spanish was a great help in translating some of the articles I came across as well as the correspondence which in some cases were done in Spanish. Seeing

that I don't speak any of the languages mentioned, it meant that I had to exclude some of the information I found like that in Russian, Hungarian and Chinese from my analysis.

The Nature of the Internet:

The Internet is a wonderful tool to look for information on diverse topics, information which might not be available locally. It also allows one to communicate with people across the world. It was extremely useful in this case, because it allowed me to get information on a topic which has not enjoyed much scholarly attention in South Africa. However it also presents certain obstacles which can definitely hinder the research process.

Disadvantages of Using the Internet as a Research Tool:

The first of these is the transient and unstable nature of the information on the Internet. Sometimes one comes across very interesting websites and might even bookmark it for later perusal, however if you go back to the same website a few weeks later, one finds that one can no longer gain access to the website, the website address has changed or the website is under construction which means that one can not conduct any searches. This was a big obstacle in this case. It happened at least three or four times that websites that I had bookmarked, were not available anymore when I went back to them a few weeks later. To avoid losing any valuable information, I decided to print all the information and kept all the information pertaining to a particular network in a separate file.

As mentioned earlier Internet is great in that it allows one to communicate with people all over the world almost instantaneously, one does not really even have to know the person that you are communicating with. However, although I found sending network

administrators and people involved in the creation and management of intellectual/scientific diaspora networks less time-consuming and relatively cheap compared to more conventional methods like conducting face-to-face interviews or mailing out questionnaires, this method is not without its set of problems. For one, of the 21 e-mails I send out initially, only two people responded. Of the second set of e-mails I send out to network administrators, only those from the Croatian Network, the Uruguayan Network, the Association of Kenyans Abroad and the Polish Scientists Abroad networks responded.

I think that the fact that I did not have any kind of relationship with these people and were then asking them for information meant that they did not feel any kind of obligation towards me and thus did not feel any kind "pressure" to respond to my e-mails. The impersonal nature of the Internet does not facilitate the building of any relationship of trust which is necessary if one wants to conduct more in-depth research. I think the only reason why some of the people from the Latin American countries responded is because they have worked with my supervisor and I used him as a reference.

Another hurdle in this whole e-mail process is the fact that people's e-mail addresses change all the time and also the computer is very specific about the format in which it accepts certain e-mail addresses. This means that some times e-mail is returned because of the wrong e-mail address or the format of the address is wrong and if you don't know the correct format, you simply don't have access to the person. I certainly experienced this problem while conducting the study.

Advantages of Using the Internet as a Research Tool.

The Internet is an extremely useful resource to use in conducting research and it was certainly the most appropriate research tool to use for this specific topic. It allowed me to have access to diverse and plentiful information I would not otherwise have had access to. The Internet is not only the main tool for linking network members and for facilitating communication between them, it is also the main tool for promoting these networks and for making them visible to potential network members and to the rest of the world.

Through the Internet, I gained the opportunity of analyzing these different networks as well as comparing and contrasting them. This was a useful exercise, because from the analysis of these networks it seems that a number of countries are making use of the diaspora option in combating the brain drain problem. The Internet thus allows other countries that are considering setting up an intellectual/scientific diaspora network, the chance of learning from the experiences of other countries. This highlights another advantage of the Internet, the fact that anyone who has access to a computer, has access to a wealth of useful information.

This study thus used a combination of different methods. The Internet allowed me the opportunity to gain an abundance of diverse and interesting information which gave me a good idea of the nature and dynamics of scientific/intellectual diaspora networks.

Through the in-depth interview and informal discussions with the professor from

Colombia as well as through my involvement in the SANSA project I gained a more in-depth understanding as well as hands-on experience of what the setting up and organization of a scientific/intellectual diaspora network entails.

University of Cape Town

Results

The searches that were conducted on the Internet produced very interesting results. Over a period of six months I discovered a total number of 35 networks. These networks however could not all be classified as intellectual/scientific diaspora networks to the same extent. The networks found can be classified into four categories: intellectual/scientific networks, cultural networks, student networks and local associations of expatriates. All these different networks have one thing in common, they aim at connecting expatriates of a particular country. However since this study is only concerned with intellectual/scientific networks, only those networks which fit the description of intellectual diaspora networks will be included in the analysis. In order to be classified as intellectual/scientific diaspora networks, they must fit the following criteria:

1. their members must be nationals of a particular country living and working or studying abroad,
2. members must be highly skilled, active in a number of professional fields, specifically conducting scientific research,
3. the networks must have as their main purpose the economic and social development of the country of origin and
4. there must be a degree of connection or linkage between different network members and between network members and their counterparts in their country of origin.

For a broad description of the intellectual/scientific diaspora networks included in the analysis see *Table2*.

Name Of Network/Association	Year Initiated	Members	Membership Fee	Links With Any Political Party/Governmental Organization	Managed By
The Polish Scientists Abroad	1994	Researchers and scientists of Polish descent working abroad	No	Yes, links with government of Poland and the state committee for scientific research	Database is managed by the information processing center which is linked to the state committee for scientific research
Irish Research Scientists' Association	1993	Practicing scientists in Ireland, Irish scientists working overseas, students and other research institutes	Yes	No	Committee consisting of researchers from different disciplines and institutions in Ireland
Association of Thai Professionals in America and Canada	1991	Professionals from a wide range of professional fields of Thai origin in North America and Canada	No	Yes, it does work with certain governmental agencies	Board of directors
Iranian Scholars Scientific Information Network	1992	Educators, researchers, scholars and students of Iranian descent	No	Yes, the ministry of culture and higher education	Prof. Manssour h. Moeinzadeh

		living abroad			
India Network Foundation	1988	People from asian-indian descent as well as people interested in India	No	No	Board of trustees
Global Korean Network	1993	Highly skilled professionals, business people and students from Korean descent living abroad	No	No	Executive committee
Association of Nigerians Abroad	1993	Highly Qualified Expatriate Nigerians over the age of 18 as well as any individuals interested in Nigeria	Yes	No	Executive Council Consisting of 18 Members
The Brain Gain Network (Philippines)	1993	Highly Skilled Individuals of Filipino descent	No	Yes, the Science and Technology Advisory Council and the Department of Science and Technology	Group Consisting of Brain Gain Members in San Fransisco in collaboration with the Science and Technology Advisory Council
The Tunisian Scientific Consortium	1994	Scientists, researchers, students not only of Tunisian origin, but anyone interested in Tunisia as well	Yes	Yes, receives funding for certain projects and grants from government	International Board of Directors consisting of seven members.

		as research institutions, laboratories, universities and corporations.			
The Network of Arab Scientists and Technologists Abroad	1992	Arab scientists working in the West in academia and industry	Yes	Yes, the Higher council for Science and Technology and the Ministry of Education	Dr. Munir Nayfeh
Colombian Network of Researchers and Engineers Abroad "Red Caldas"	1991	Highly Qualified Researchers and Engineers Abroad, who are not necessarily of Colombian Nationality	No	Yes, the Colombian Institute for Science and Technology Development (COLCIENCAS)	COLCIENCAS (Colombian government agency for science and technology)
Worldwide Indian Network	1990	Students, professors, engineers, scientists, physicians, accountants, business people, journalists, etc. from Indian descent	Yes	No	Executive Committee

3.1) General Overview of Networks:

The next section will give just a general overview of the different intellectual/scientific diaspora networks. After that, I will discuss five of them (SANSA, Red Caldas, Brain Gain Network (BGN), Tunisian Scientific Consortium and the Network of Arab Scientists and Technologists Abroad (ASTA) as case studies to give a more detailed and specific analysis of the dynamics of intellectual/scientific diaspora networks. I have decided to focus on these specific networks because I have a lot more information on them. The reasons for this are that I have been very involved in the setting up of the SANSA network, work very closely with one of the main initiators of the Caldas Network and the websites of the other three networks contain more detailed information than any of the other networks found. The other networks were excluded on the basis that although their websites did offer interesting information, it was not sufficient to do a detailed analysis of the network.

Administration of Networks:

All of the networks studied were set up in the early 1990's and were in many instances initiated by a group of expatriate students or scientists and researchers who recognized the need for an initiative of this kind. All of them have a website which is the initial entry point for potential members. These websites usually contain an on-line membership application form which prospective members are required to fill in. After completing the membership application form they technically and officially become network members and are entered on a database.

Except for a few networks, all of them are non-profit, independent entities which are not affiliated to any political party or the national government. Networks like the Iranian Scholars' Scientific Information Network, the Association of Thai Professionals in America and Canada, the Polish Scientists Abroad, the Brain Gain Network, ASTA and the Red Caldas do have linkages to particular government agencies, notably the State Committee for Scientific Research (Poland), the Ministry of Higher Education (Iran), Science and Technology Advisory Council (BGN), Department of Science and Technology (BGN) and the Higher Council for Science and Technology (ASTA).

These networks are managed by an executive committee or executive council which varies in size according to the size of the network. The fact that most of them are independent organizations means that all of them except for the Tunisian Scientific Consortium don't receive any funding from the national government and thus require their members to pay a fee which is the only source of income for most of them.

Network Members:

Membership for most of the networks is open to researchers, scientists, students, business people and in some cases like the Irish research Scientists' Association, the Association of Thai Professionals in North America and Canada and the Tunisian Scientific Consortium to research organizations and business organizations interested in the development of the country of origin. Most of the networks require their network members to be expatriate nationals of their particular country, except for SANSAs, Red Caldas, the Tunisian Scientific Consortium and the BGN which do not restrict

membership to expatriate nationals, but allow anyone who is interested in the development of the particular country to join their network. Some networks like the Irish Research Scientists' Association and the Tunisian Scientific Consortium have quite a complicated membership structure. Type of membership can range from student, professional, associate and corporate membership.

Purpose of the Network:

These networks aim to establish and foster communication and exchanges between members living abroad and to link them to their counterparts in their country of origin. The educational, social, cultural and professional advancement of their members is also high on the priority list of the different networks. These are closely related to the main objective of all intellectual/scientific diaspora networks, which is the economic, political and social development of the countries of origin.

Activities that Network Members Engage in:

To ensure that the above-mentioned goals are met, network members engage in various activities and organize different social, cultural and educational events. These include conferences, seminars, workshops, focus group discussions as well as social events such as dinners, Christmas parties and picnics. Networks like the Global Korean Network, BGN, ASTA and the Tunisian Scientific Consortium organize annual conferences which focus on specific issues of interest to members as well as the country of origin. All the networks have a newsgroup or newsletter, which comes in either a paper or electronic version aimed at fostering communication between network members and to inform

members about the latest developments at home. In addition, particular networks like the Tunisian Scientific Consortium and ASTA have specific digests and periodicals in which scholarly articles and books written by network members are published. To ensure the economic and social advancement of the country of origin, network members engage in various joint developmental projects with government agencies and private and non-profit organizations. The Association of Nigerians Abroad for example have a number of committees dedicated to specific areas of concern to Nigeria and each member on joining the association has to indicate on the membership application form which committees he/she wishes to join and become involved in. These include; an Education Committee, Technology Committee, Public Relations Committee, Finance Committee, Rules Committee, Election Committee, Fundraising Committee, Political Affairs Committee and a Health Affairs Committee. The network members thus organize purposeful actions and activities aimed at meeting the goals of the networks

After this overview of the most common features of the intellectual/scientific diaspora networks, it is necessary to refine the analysis with some detailed case studies. The next section will focus on observations made on five different networks.

3.2) Case Studies

CASE STUDY NO.1: The Brain Gain Network Of The Philippines

1) Administration and Organization of the Network:

The Brain Gain Network was established in June 1993. It was initiated by a group of graduate Filipino students based at Stanford University and the University of California in collaboration with Filipino professionals working in the San Francisco Bay area.

The Brain Gain Network is managed by a group of network members located in the San Francisco Bay area along with the Science and Technology Advisory Council, the Makati Business Club and the Department of Science and Technology in the Philippines. This group is not only responsible for the administration of the Brain Gain Network, but also for promoting and advertising the network as well as recruiting potential network members. This is done through an on-going lecture series, the Internet and the media. Although this core group handles a lot of the administrative tasks of the Brain Gain Network, network members are encouraged to take the initiative in organizing social, business and professional activities and to encourage dialogue between themselves and between them and the business and academic community in the Philippines.

Potential network members are required to fill in a database information sheet which can be filled in either electronically via the Brain Gain Network website. Copies of the database information sheet are also distributed at the lectures presented by the network.

administrators and interested individuals have an opportunity to fill it in and submit it to the administrators. Once an individual submits an information datasheet he/she is automatically considered a member of the Brain Gain Network. Members' information is stored in a database. Copies of the database are distributed to individual members of the network in electronic form to facilitate closer interaction and connection between network members. The database is a strategic starting point from which network members can build co-operative business and professional relationships. This database is also available to business, academic, governmental and non-governmental organizations in the Philippines which facilitates the formation of business and other research projects between network members outside the country and the Philippines community. These projects ultimately benefit the economic and social development of the Philippines.

2) Network Members:

Brain Gain Network membership is not restricted to people from Filipino descent. Members are highly skilled and are spread all over the world. Within the first year of the creation of the Philippines network, network membership reached 330, whereafter it increased to 463 in the next year.

a) Geographical Location of Brain Gain Network Members:

Members of the Philippines Brain Gain Network are spread across the world in 20 countries, including the Philippines. The greatest concentration of network members is in the United States of America with 67.2% of network members being resident in this country. A significant number of network members are also living in the Philippines which means that membership is not restricted to Filipinos outside the country. (*refer*

to table3). Figure five presents the countries in which most of the BGN members are based.

Table3

<i>Country</i>	<i>#BGN Members</i>	<i>Percentage</i>
United States	311	67.2
Philippines	81	17.5
Australia	15	3.2
Japan	8	1.7
Thailand	8	1.7
Canada	8	1.7
United Kingdom	7	1.5
Belgium	6	1.3
Hong Kong	4	0.9
Others (11)	15	3

b) Expertise and Skills of Network Members:

Brain Gain Network members are highly skilled. The majority of network members are in the scientific, technological and business fields. Computer sciences and engineering and architecture feature at the top of the list with the majority of network members being active in these fields (*refer to table4*). However, the Brain Gain Network is not for natural scientists and businessmen exclusively, people in management, social sciences and arts and sports are also invited to join the network. In fact, any highly

qualified person, irrespective of what field he/she works in, is encouraged to join the network

Table 4

<i>Expertise Category</i>	<i>#BGN Members</i>	<i>Percentage</i>
Computer-Related Fields	194	41.9
Engineering, Architecture, Surveying	167	36.1
Mathematical and Physical Sciences	67	14.5
Business	64	13.8
Life Sciences	56	12.1
Other Fields	43	9.3
Social Sciences	42	9.1
Managers and Officials	42	9.1
Education	38	8.2
Administrative Specialization's	36	7.8
Communications	22	4.8
Entertainment and Recreation	15	3.2
Writing	14	3.0
Medicine and Health	14	3.0
Law and Jurisprudence	11	2.4
Miscellaneous Fields	8	1.7
Art	6	1.3

Philosophy, Religion, and Theology	3	0.6
Museum, Library, or Archival Sciences	2	0.4

c) Qualifications of Network Members:

Network members are highly qualified with over half of the membership being in possession of an advanced degree (masters and doctorates). A significant number of network members hold masters degrees and 22.7% of network members either hold or are in the process of obtaining a doctorate degree (*refer to table5*). This is an indication of the quality and expertise of network members.

Table5

<i>Advanced Degree</i>	<i>#BGN Members</i>	<i>Percentag e</i>
Advanced Degree Holders	265	57.2
Masters Degree Holders	160	34.6
Holding Doctorate (or in progress)	105	22.7

3) Purpose of the Network:

The Brain Gain Network aims to connect network members and to facilitate cooperation and communication between them. It also facilitates cooperation between network members and business, academic and governmental institutions in the

Philippines in the hope of reversing the “brain drain” and boosting the Philippines economy. The main purpose of the Brain Gain Network is thus to increase the competitiveness of the Philippines economy in world markets. This is done by promoting entrepreneurial skills in the network, especially in the area of high technology.

4)Activities of Network Members:

In order to meet the above-mentioned goals, network members engage in various social, academic, business and research activities. The diffusion of information contained in the Brain Gain Network database means that every network member as well as business, academic, governmental and non-governmental organizations in the Philippines have access to it. This is important as it facilitates collaborative research and business projects between network members as well as between them and their counterparts in the Philippines.

The Brain Gain Network(BGN) also has an Internet newsgroup and a newsletter which provide members with information regarding the latest developments in the network as well as at home. The fact that 84% of network members have e-mail access makes the process of connection and communication between members as well as between them and partners in the Philippines a lot easier.

In addition to this the BGN has an on-going lecture series which serves the purpose of informing potential members of the BGN as well as encouraging debate and discussion between network members. The BGN also has focus groups which focus on specific topics of interest to members and ultimately the Philippines. These topics include the

opportunities for software development, opportunities for integrated circuit design, electric vehicles, public policy for technology transfer and alternative forms of power generation in the Philippines.

Specific projects that network members devote themselves to are; the creation of companies in the Philippines, the provision of consulting services to Filipino corporations and government/academic agencies and the formation of foreign-based companies to do business in the Philippines.

Finally, the BGN organizes an annual picnic which allows closer interaction between network members and the opportunity for members to discuss social, political and economic issues of interest to the Philippines in an informal manner.

CASE STUDY NO.2: The Network Of Arab Scientists And Technologists Abroad (ASTA)

1) Administration and Organization of the Network:

ASTA was established in 1992. It is a non-profit, private, educational and scientific organization that is not linked to any political organization. ASTA is more of a regional network incorporating the countries in the Arab world, compared to the other networks discussed so far which are more national networks. The extent to which ASTA is in actual fact a regional network is questionable though, because the country that features most is Jordan, without much mention to any other countries. ASTA was initiated at the University of Illinois, Urbana-Champaign and this is also where the headquarters of ASTA are based.

ASTA is managed by a board of directors which consists of nine board members of which Dr. Munir Nayfeh, a professor in Physics at the University of Illinois, is the president. ASTA has a website containing a lot of information regarding the activities of the network as well as links to the personal websites of network members. The website also contains an on-line registration form which potential network members can fill in. Interested individuals also have the option of e-mailing Dr. Munir Nayfeh should they wish to join the network. Once members have filled in the registration form, they are considered members of the Network of Arab Scientists and Technologists Abroad and are then entered into a database.

Although ASTA is an independent organization, it does have cooperative relationships with certain non-governmental, governmental and academic organizations. These institutions include the United Nations Educational, Scientific and Cultural Organization (UNESCO), ALESCO

which is the local branch of UNESCO, the High Council for Science and Technology of Jordan, the Applied Science University, Princess Sumaya University College for Technology, Jordanian Badia Research and Development Program and the Crown Prince Award of Jordan. ASTA's connection to these organizations is important in that it stimulates the development of scientific research projects and other innovative projects in support of the economic and social advancement of the Arab world.

ASTA receives financial resources from international donor agencies that support the development of science, technology and education as well as from the membership fees paid by the network members. Members pay a fee based on their type of membership, e.g. regular members pay 100 dollars, associate members pay 50 dollars (graduates and visiting scholars) and students pay 25 dollars, honorary members pay 100 dollars.

2) Network Members:

a) Geographical Location of ASTA members:

Membership of ASTA is open to all scientists and technologists of Arab origin living and working in the industrialized countries of North America, Western Europe and Japan. Scientists and technologists who are not of Arab origin, but are interested in contributing to the development of the Arab world are also welcome to join the network.

b) Expertise and Skills of ASTA Members:

ASTA members are highly skilled and highly qualified. They are active in the fields of scientific research and work in research, educational, industrial and technological institutions. Membership however is not restricted to those individuals in the natural sciences, but also includes the social

sciences and humanities. ASTA in its drive to maintain the excellence and high standards among its members, publish a set of scientific journals and periodicals and members are encouraged to publish scholarly articles on a regular basis.

c) Membership Profile:

ASTA has three types of membership:

Regular Members: these consist of individuals of Arab origin active in the scientific, Research, educational, industrial and technological institutions in advanced industrialized countries.

Associate Members: these consist of students or visiting scholars of Arab origin who are based at the scientific, research, educational, industrial and technological institutions in the industrial countries.

Honorary Members: these consist of individuals in the industrialized countries, who are not of Arab origin, but have the expertise and are willing to contribute to the goals of ASTA.

3) Purpose of the Network:

ASTA has several goals. These include:

- "the promotion of scientific and technological cooperation between and among Arab scientists in the industrialized countries and the Arab world"
- "the convening of international technical and scientific meetings in locations of easy access to its constituency"

- the dissemination of information to promote research and development in the Arab world with the collaborative expertise of Arab scientists and technologists and their institutions in industrialized countries"
- "assisting in the establishment of vehicles for the popularization of the study and pursuit of careers in science and technology by students who wish to do so in the Arab world"

The overall goal of ASTA then, is the transfer of scientific and technological know-how from the industrialized western countries to the Arab world for the economic and social upliftment of the Arab countries.

4) Activities that Network Members Engage in:

ASTA organizes a range of conferences, workshops, and seminars to ensure that the goal of the dissemination of scientific knowledge is met. These include; collaborative conferences between ASTA and the Jordan University for Science and Technology and the High Council for Science and Technology, the International Energy Conferences and Exhibition in collaboration with the University of Bahrain, the Water Conference, Desalination conference, Environmental Conference as well as various workshops such as the Gaza workshop, the Al-Ain workshop and the Lebanon workshop. All these are organized to bring together ASTA members as well as other interested parties to discuss and share ideas on issues pertaining to the economic, social and educational advancement of the Arab world.

To achieve its goal of encouraging students to pursue careers in science and technology, ASTA organizes various programs, e.g. the Young Ambassador program and the prize system for high school students. This is done in collaboration with the Badia Development program, the High Council for Science and Technology as well as the Ministry of Education.

ASTA also publishes professional and technical journals in which network members are encouraged to publish articles written by themselves as well as newsletters to facilitate dialogue and discussion between ASTA members and their counterparts at home. These also serve the purpose of encouraging closer connection between ASTA members and between them and the Arab community at home.

1) Administration and Organization of the Network

The TSC was founded on November, 18 1994 by a Founding Board consisting of 14 members.

The TSC is a non-profit, independent, non-governmental, apolitical organization that has branches in a number of different countries or groups of neighboring countries.

The TSC has a website which contains a significant amount of information regarding the establishment and administration and organization of the network. It also contains an on-line registration form which potential members can fill in. This on-line registration form comes in two formats, an individual membership form and a corporate membership form. After completing the registration form, they are automatically considered network members. They are entered into a database and are entitled to the benefits which membership of the TSC holds. One of these is the opportunity to run for office on the TSC's governing structure.

The TSC has quite a complicated governing structure. It is managed by an international Board of Directors that consists of seven members, mostly presidents of the different branches. It also has a legislative board which is responsible for the drafting and changing of the TSC's constitution. The TSC also has a number of different affiliates in the different fields of sciences as well as Volunteer Working Groups which are made up of members in similar fields and with common scientific interests. The Board of Directors has amongst other responsibilities, the task of

overseeing and ensuring the implementation of programs in the interest of Tunisia's economic and social advancement.

The TSC's main sources of income are the membership fees paid by members, subscription fees which members have to pay to subscribe to the scientific journals published by the TSC, private as well as government funds and donations and grants. As mentioned earlier, the TSC is an independent, apolitical organization and only accepts grants and donations which will not impede on its independent character.

2) Network Members:

a) Geographical Location:

Members of the TSC are usually, but not exclusively of Tunisian origin and are spread over a number of different countries. These include the Middle East, Northern Africa, other African countries, Europe, North America and Asia. The following table contains figures representing the spread of Tunisian experts abroad. These do not reflect the membership of the TSC, but the overall population of Tunisian experts living and working abroad. They are useful though in that they give the reader insight into the vast pool of Tunisian human resources located abroad and the impact they could have on Tunisia's economic and social development if they could be mobilized in the way the TSC hopes to do (*refer to figure 8*) (Henchi:1997)

Table 6

Country	No. of Tunisian Experts
Middle East	6634
Northern Africa	206
African Countries	72
Other Countries	268

b) Expertise and Skills of Network Members:

TSC members are highly skilled and highly qualified and possess expertise in a variety of fields. This is not surprising when one considers the fact that Tunisia after its independence, invested a great deal of resources in educating its youth, a lot of whom left Tunisia to pursue further study abroad. The following table again does not necessarily reflect the membership of the TSC, but rather that for the overall population of Tunisian experts abroad. However it is included here to give the reader an overview of the potential skills profile of TSC network members (refer to table 7).

Table 7

Field of Expertise	No. of Tunisian Experts
Education	2984
Health	2157
Administration	246
Transport and Telecommunications	274
Public Works	206

Electricity and Mechanics	879
Agriculture	87
Other Fields	347

c) Profile of Network Members:

The TSC membership is open not only to scientists, researchers and students of Tunisian origin, but research institutions, laboratories, universities and corporations can also register as members of TSC. The TSC thus has four types of membership: student and professional members which is open to students and professionals in Tunisia and abroad, associate membership which consists of non-Tunisian scientists and Tunisians who do not fall into aforementioned category.

Corporate membership is open to scientific organizations, research institutions, universities and corporations with research and development orientations and associate corporate members is open to non-Tunisian organizations with the aforementioned orientation.

2) Purpose of the Network:

The main purpose of the network is to utilize Tunisia's vast pool of scientific and technological human resources to assist in Tunisia's economic development and to improve Tunisia's competitiveness in the world market. The TSC aims to do this by facilitating networking and cooperation between members of Tunisia's scientific community, both in Tunisia and abroad.

4) Activities of Network Members:

The TSC engage in a number of different activities to ensure the attainment of the above-mentioned goals. These include the monthly publication of TSC chronicles, the quarterly

published General Newsletter which serves the purpose of informing members about the latest developments in the network.

The TSC also has an electronic mailing list to facilitate communication, discussion and connection between network members and between them and their colleagues at home. Other projects/activities include the publication of scientific journals, magazines and technical reports. TSC keeps databases of Tunisian human and material resources in science and technology both in Tunisia and abroad.

The TSC organizes scientific conferences and seminars to encourage the sharing of information and knowledge regarding scientific and technological developments and innovations. The TSC also initiates cooperative research programs between scientific institutions in Tunisia and their counterparts in other countries.

Part of the TSC's activities also include the organization of short courses and training courses in the practical application of science and technology. These courses are offered to individuals in the academic as well as the industrial sectors. In addition to all the above another program which the TSC runs in its efforts to boost Tunisia's economic development, is to encourage Tunisian graduates abroad to return to Tunisia by finding them employment in Tunisia. All these activities are very structured and well defined and are all organized by the TSC in its drive to make Tunisia more internationally competitive by using Tunisia's highly skilled human resources both inside and outside of the country.

CASE STUDY NO.4 : The Colombian Network Of Scientists And Engineers Abroad

1) Organization and Administration of the Network:

The Caldas Network of Researchers Abroad was created in 1991. The creation of the Caldas Network coincided with the realization of Clemente Forero, the director of COLCIENCAS, that the country's expatriate scientists and engineers is a great potential resource which can be used for the development of Colombia. He went on a worldwide tour to every country where Colombian scientists were based and sold his idea to Colombian researchers and scientists (Schlemmer:1997:7).

The Caldas network is thus a joint initiative between the Colombian Institute for Science and Technology Development (COLCIENCAS) and Colombian researchers and scientists abroad. The network consists of 21 nodes with each node located within a specific country. These are Germany, Argentina, Australia, New Zealand, Belgium, Canada, Chile, Spain, France, Great Britain, Holland, Italy, Japan, Mexico, Switzerland, Puerto Rico, Russia, Sweden, Venezuela, Brazil, New York. The Caldas network is thus very decentralized with each node being independent from one another. Each of the nodes is managed by one or more coordinators. Different nodes are responsible for their own administration and for organizing their own activities and actions.

These nodes differ in terms of the fields that network members are involved in as well as the level of activity and action generated in these nodes. For example the Swiss node is very active

in organizing joint international research projects between Colombian researchers and is also more orientated towards the natural or “hard” sciences, whereas the New York node on the other hand is more orientated towards the arts. Each node thus has a character of its own and is in some cases like the British node for example, very isolated from the rest of the nodes (Schlemmer:1997).

2) Network Members:

a) Socio-Demographic Characteristics of Network Members:

Network members are mainly, but not exclusively of Colombian origin, are spread all over the world and are active in the fields of research and science and technology. The majority of the members of the Caldas

Network are between the ages of 24 and 44, which means that they are still relatively young and are still establishing themselves in their chosen fields (*see figure 1*). The network is mostly composed of males, with females constituting only 33% of the network membership (Charum and Meyer:1998).

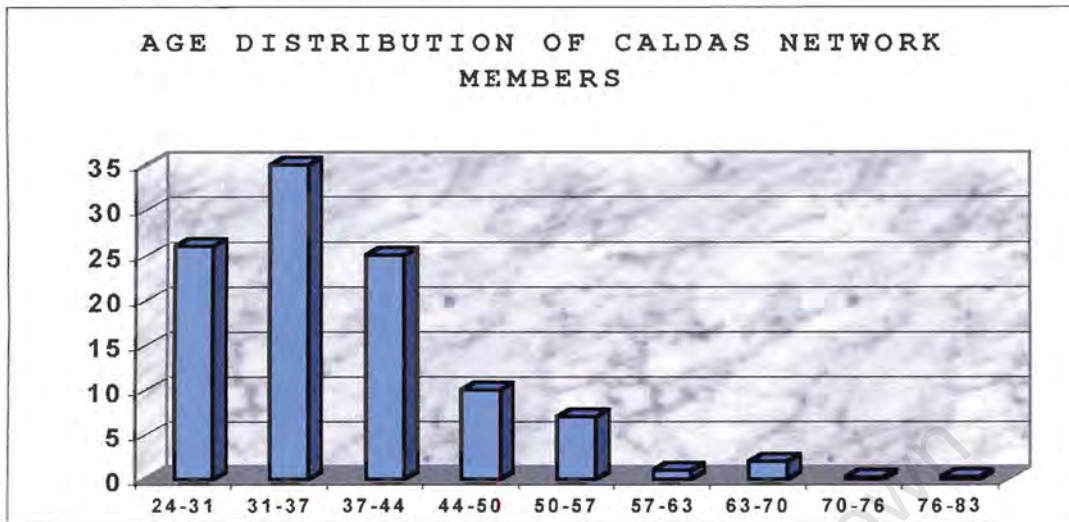


Figure 1

The Caldas network is a national network, with Colombian nationals constituting 80% of the network (Charum and Meyer:1998:144). This is not surprising as one would expect that in a network of this nature (intellectual/scientific diaspora network), the majority of network

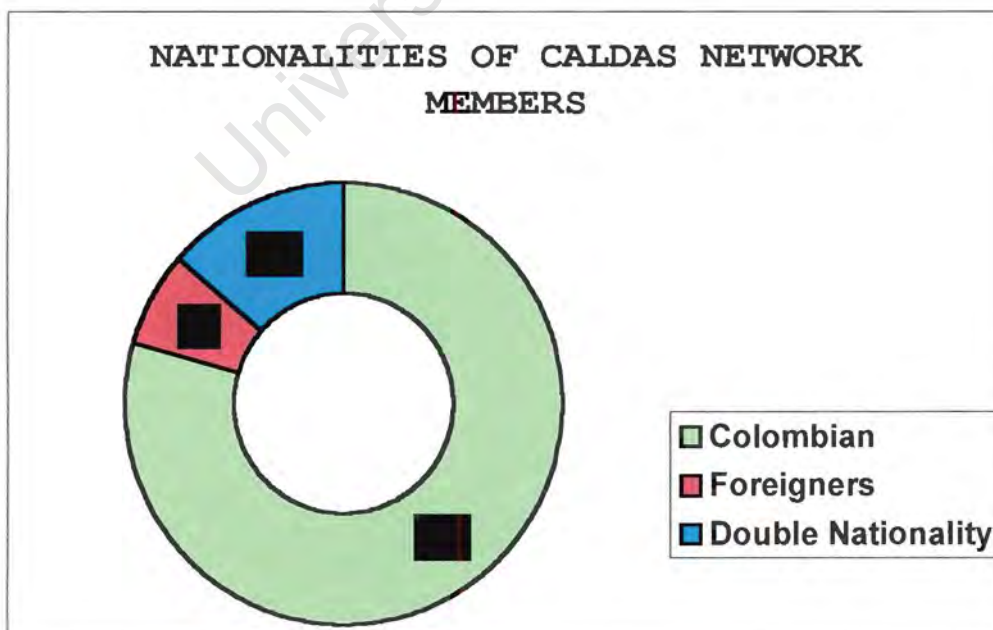


Figure2

members would be expatriate nationals. A number of the network members also have dual nationalities, with non-Colombians constituting only a small percentage of network membership (see figure 2).

b) Geographical Location of Network Members

The Caldas network is a worldwide network with members being spread all over the world. Network members are located in 23 different countries, with 53% of network members living and working in Europe (see figures 3&4). Figure 4 represents only the six major countries in which network members are based. The other countries were not included since the number of Caldas network members in these countries represent less than five percent of network membership.

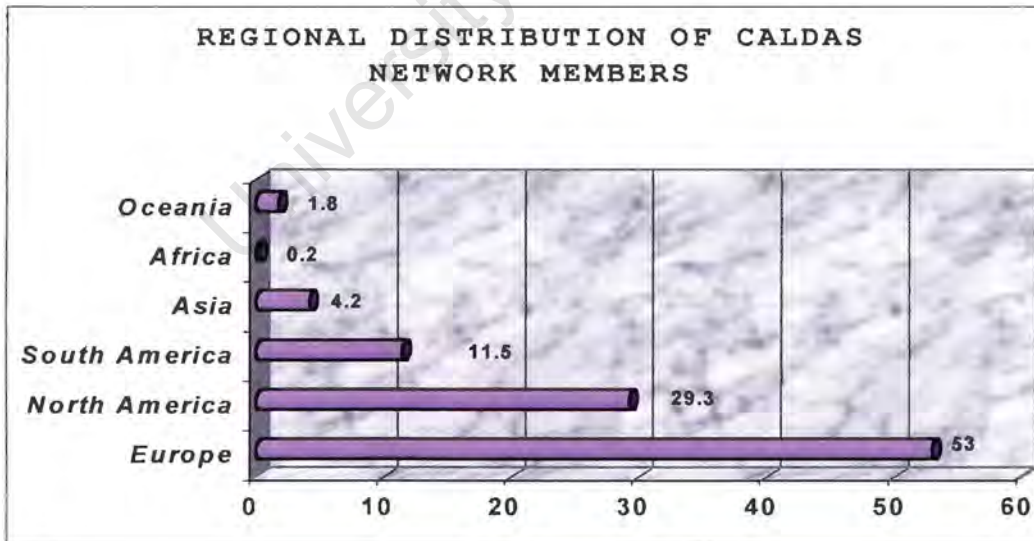
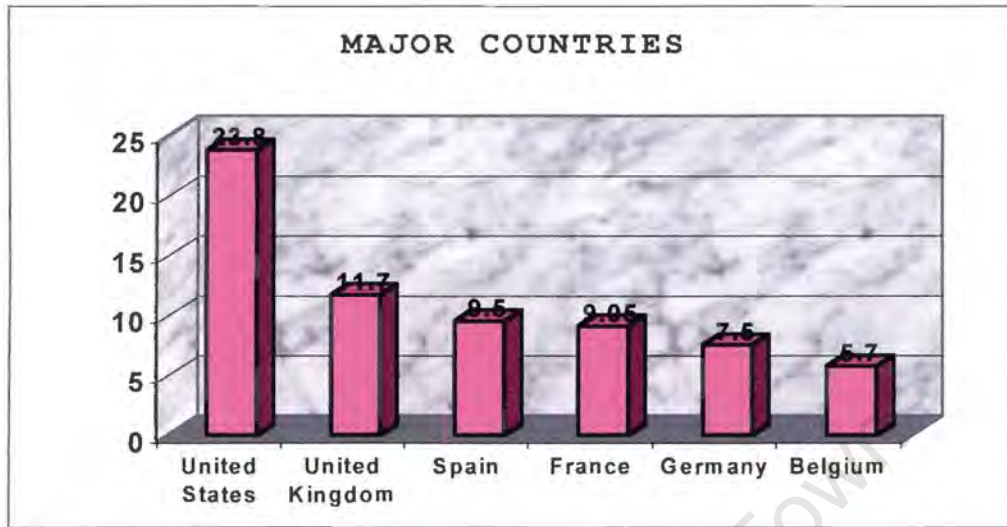


Figure 3

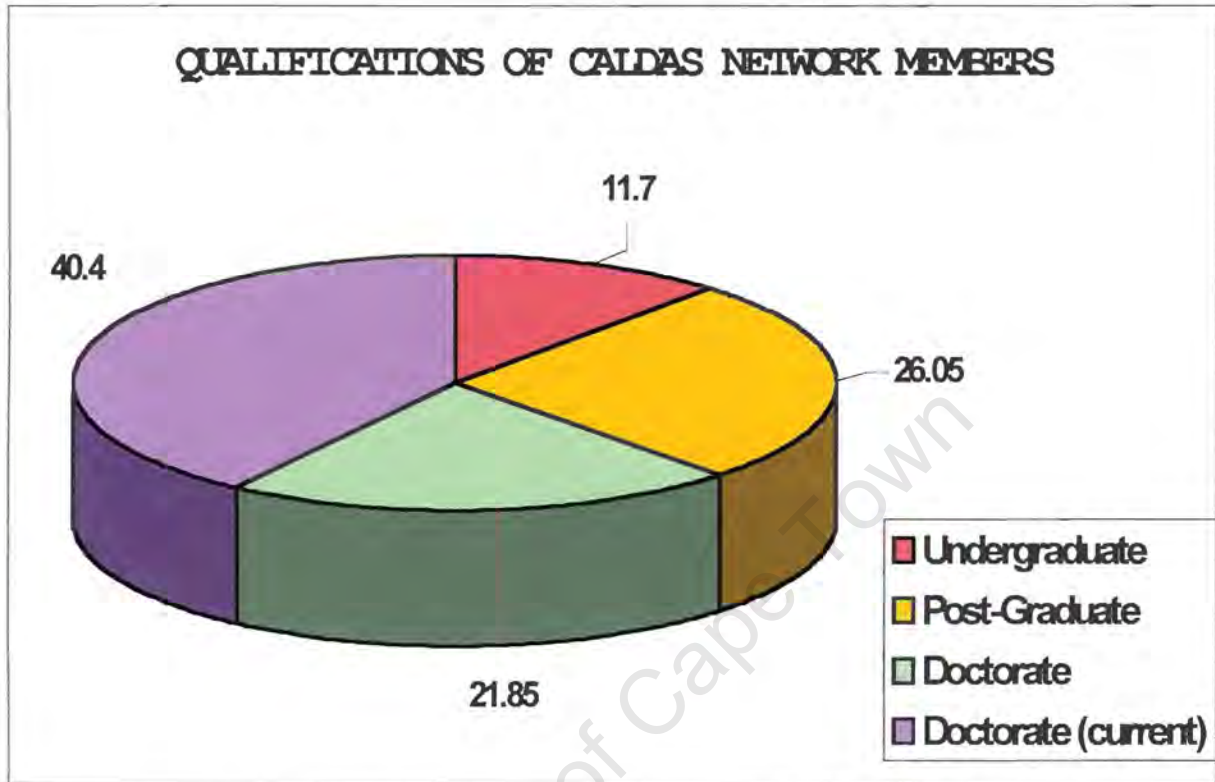
Figure 4



c) *Qualifications and Skills of Caldas Network Members*

The majority of members of the Caldas network left Colombia to pursue further study in other countries, in fact 53% of Caldas network members are still studying or working and studying at the same time (Meyer:1999). A significant number of network members are still in the process of completing their doctoral studies (*see figure 5*), which makes the Caldas network much more of a student network than the other networks discussed so far.

Figure 5



Caldas network members are active in a wide range of different fields and disciplines. Nineteen different disciplines are represented in the Caldas network. These include biology, medicine, information technology and electronics, education, construction, physics, economics, psychology, social sciences, chemistry, law and politics, electrical engineering, agriculture and fisheries, chemical engineering, mechanical engineering, mathematics, literature, earth sciences and arts. The three disciplines that most of the network members are involved in are biological sciences, medicine and information technology and electronics (Charum and Meyer:1998:59). This indicates that Caldas network members possess a variety of skills and vast pool of knowledge that Colombia can tap into for its economic and social development.

3) Purpose of the Caldas Network:

The Caldas network aims at involving expatriate scientists and engineers in the economic and scientific development of Colombia without having to physically return to Colombia. It also aims to connect expatriate Colombian scientists with scientists in Colombia and to establish co-operative relationships between them (Granes et al:1997). It is hoped that this will give rise to collaborative research projects between expatriate scientists and their colleagues at home for the ultimate economic and scientific advancement of Colombia.

4)Activities of the Network Members

Every node is responsible for generating its own activities which means that action in the Caldas network is relatively decentralized and autonomous. All the nodes, except for Switzerland and some nodes in North America publish their own information bulletin which serves the purpose of informing network members about the latest scientific activities (Schlemmer et al:1997).

Individual nodes also organize conferences, seminars, meetings, round table discussions, courses concerning the use of computer tools, translation workshops and meetings for the discussion and debating of specific issues (Schlemmer et al:1997:17).

Network members are encouraged to engage in collaborative research projects. Two such projects are the Bio 2000 project and a project on the transfer of technology in the area of robotics. The Bio 2000 project is a multinational, collaborative research project between research groups from four European universities and five Latin American Universities. The aim of this project was to apply instrumentation, developed for physics and engineering to the fields of biology and medicine (Granes et al:1997).

The second project is a joint venture between the University of Valle and the University of Evry Val D'essone in France. The project involves robotics, automation and industrial networks and aims to design and construct a multi-purpose industrial robot (ibid). These projects were all initiated by expatriate Colombian scientists and are concrete examples of the role that highly skilled expatriate nationals can play in the transfer of knowledge from the more industrialized countries they work in to their home countries.

University of Cape Town

CASE STUDY NO. 5: The South African Network Of Skills Abroad

(SANSA)

The emigration of highly skilled South Africans has become a very topical issue in recent times. Many people in South Africa have expressed their concern over the loss of highly qualified human resources at a time when South Africa needs these highly skilled professionals to improve its position in the world arena. The South African Network of Skills Abroad is a project which aims at addressing this problem. Before the SANSA project is discussed however, it is important to locate this project within the broader framework of South Africa's migratory patterns

Setting the Scene:

Historical Overview of South Africa's Migratory Patterns:

A study of the official data on the migration of highly skilled people to and from South Africa shows that immigration generally exceeds emigration, except for specific years when a reverse in this pattern occurs. These include 1961, 1977 and 78, 86 and 87 and the period after 1993, when emigration was at a historic high. (Refer to figure 6)

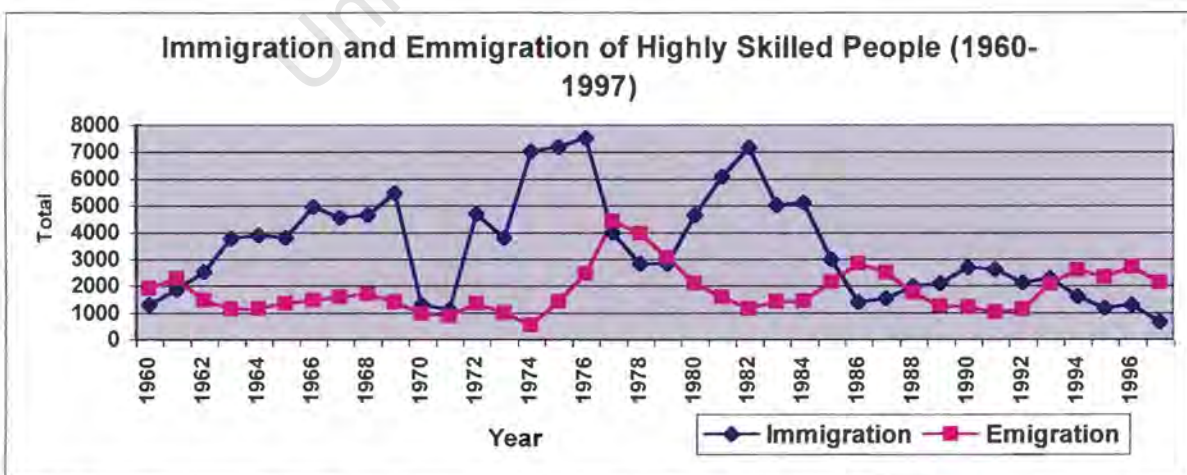


Figure 6

This suggests that specific historical events/factors may be responsible for the change in the migration pattern during the above-mentioned periods.

Kaplan (1997) outlines five historical periods marked by specific political and economic conditions, which could explain the reverse trends in the migration patterns. These include the 1961 Sharpsville unrest, the Soweto uprisings in 1976, the declaration of a state of emergency between 1985-1987 which was accompanied by unsatisfactory economic performance and the political uncertainty after 1993 fuelled by the forthcoming elections in 1994 (Kaplan, 1997).

Although one can't say that these events are directly responsible for the increase in emigration, they do qualify as significant push factors which may account for the increased outflow of people during these specific years.

The above-mentioned factors correspond to the factors outlined by Choi in her study of 46 highly skilled Asian Scholars from India, China, Hong Kong, Japan, South Korea and Taiwan and their motivations for emigrating to the United States as well as those outlined by Lachmansingh in his study of the brain drain in Guyana. According to Choi, the political and economic situation at home at the time they left as well as other personal factors served as significant push factors in their decision to leave their country of origin.

Although the official figures are useful in that it allows one to get a general picture of overall migration trends, the figures should be viewed with caution. According to Kaplan (1997), the problem with the official data is that it understates the true extent of migration. For example, a

comparison of South African data for the period 1984-1993 and that of the United Kingdom shows that the United Kingdom figures are more than three times that for South Africa. The South African data shows that 28 965 people emigrated to the United Kingdom between 1984 and 1993 while 33 640 people from the United Kingdom arrived in South Africa. The United Kingdom data, on the other hand shows that for the same period 100 700 South Africans emigrated to the UK while 52 600 people emigrated to South Africa (Kaplan, 1997, 7)

What is particularly disturbing is that this **pattern** of increased emigration continues after 1993, which means that South Africa is losing vital human resources especially highly skilled professionals at a time when South Africa has entered the world arena and is thus facing major economic and other challenges.

The above-mentioned discussion highlights the fact that South Africa has a huge pool of highly skilled human resources abroad. The diaspora option is a perfect way of utilizing this huge intellectual diaspora for the economic and social development of South Africa. This is the rationale behind the creation of the South African Network of Skills Abroad (SANSA) which will be discussed in the next section of this paper.

1) Organization and Administration of the Network:

The South African Network of Skills Abroad was initiated in 1997. It is a joint initiative between the Science and Technology Policy Research Centre (STPRC) and a French research institute called the Institute of Research for Development (IRD).

SANSA is a non-profit, a-political organization, but it does have links with the Department of Arts, Culture, Science and Technology(DACST) as well as a number of universities and

technikons in South Africa. SANSA is housed at the University of Cape Town's Development Policy Research Unit and is managed by a team consisting of two senior researchers, two research interns and an administrative assistant who in the initial stages of the project takes responsibility for the organization and administration of the project.

SANSA has a website which contains detailed information about the process involved in the construction of the network as well as an on-line registration form which is the initial entry point for potential members. Part of the "recruitment" process was also the mailing of registration forms as well as information pamphlets to South Africans living abroad to invite them to join the network. The addresses of potential network members were obtained from the alumni lists of universities and technikons in South Africa as well as South African embassies and network members' personal contacts.

Individuals that filled in the on-line registration form as well as the paper version of the registration form are considered network members. All the information received from network members are stored in a database which is a strategic tool for the facilitation of connection and cooperative relationships between network members. It is planned that in a later stage of the project, this database will be made available to all network members as well as interested organizations and institutions in South Africa. Network members will thus have the opportunity to look for potential partners in the database and to organize joint research projects and business ventures which could be of benefit to South Africa's economic development.

The project is not complete yet, the first phase, that of setting up the network and building the database is finished, the next stage, the decentralization of the network is still underway. The

SANSA project team for the moment is still in charge of the administration and management of the network, however it is expected that network members and other interested parties in South Africa will take over the administration and organization of the network after completion of the project.

2) Network Members

The network members are mostly highly skilled South Africans living abroad, however, non-South Africans who are interested and feel that they can contribute to South Africa's development are also free to join the network.

a) Geographical Location of SANSA members:

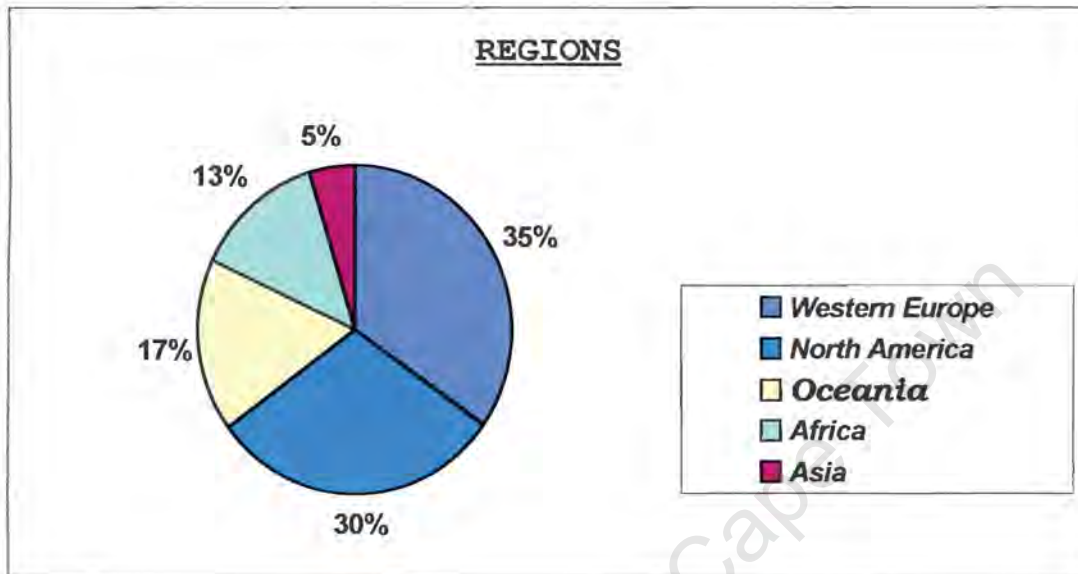
SANSA is a truly worldwide network with members being spread over 57 countries, five main world regions and 800 different cities. The overwhelming majority of SANSA members are located in six major countries (*see figure 7*) with the greatest number of members living in the United Kingdom. Sixty-five percent of SANSA members are resident in Western Europe and



Figure 7

North America (see figure 8).

Figure 8



b) Socio-Demographic Characteristics of SANSAs members:

The overwhelming majority of SANSAs members are male and are in their 40's, 50's and 60's.

Twenty-nine percent of SANSAs members are in their 50's (see figure 10). This suggests that members have acquired a wealth of experience and skills in their chosen careers and are in a good position to contribute their knowledge to the development process in South Africa. This is supported by their positions as many of them occupy senior positions in their chosen occupations. (see figure 9)

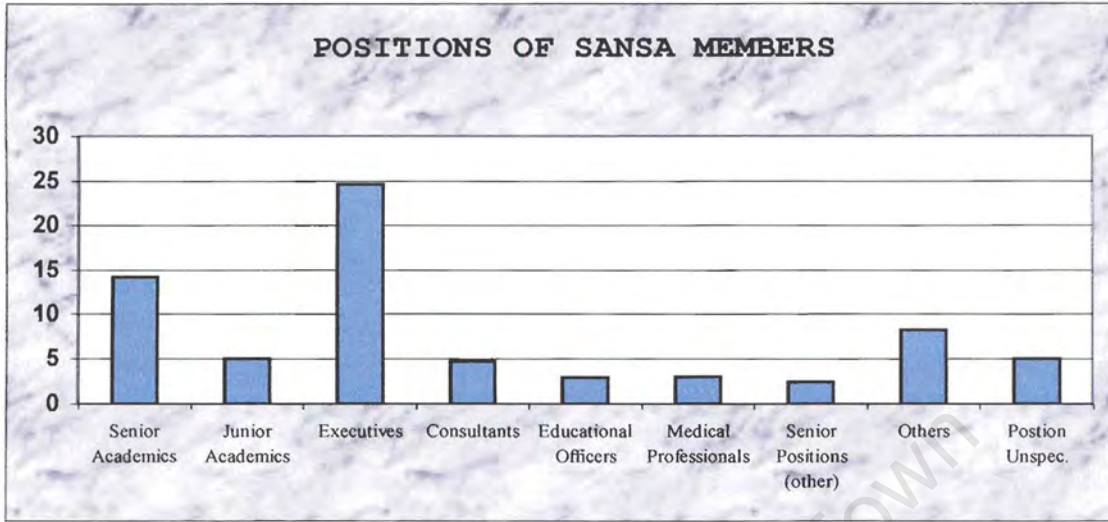
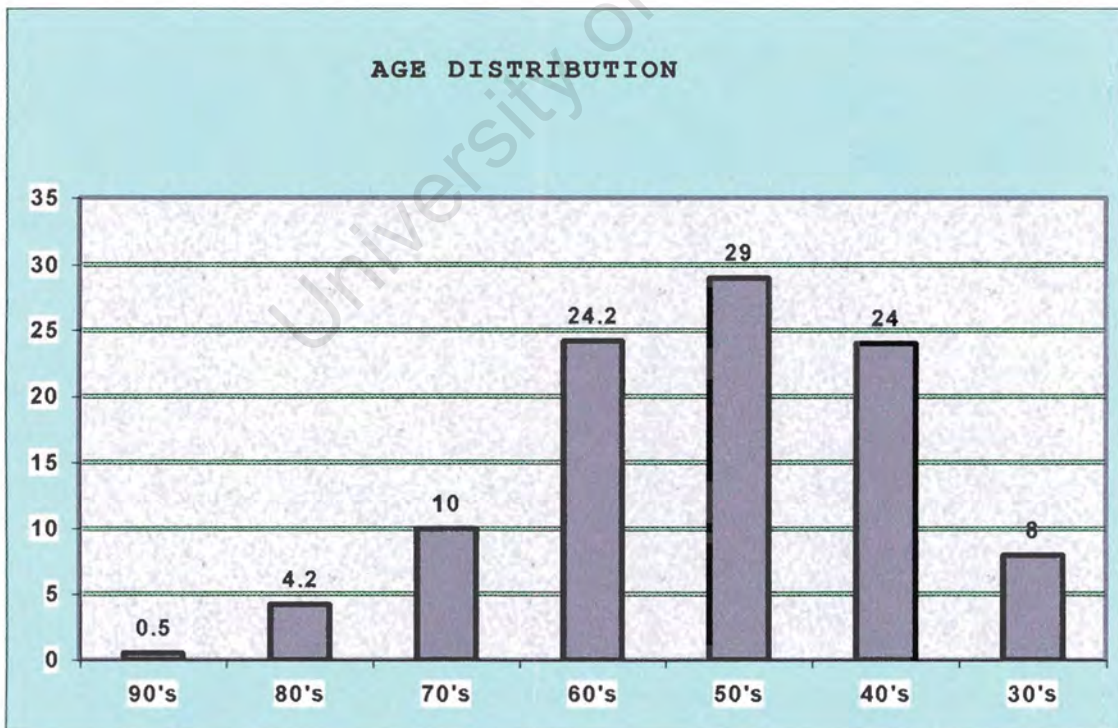


Figure 9

Figure 10



SANSA is a multi-national network with 36 nationalities being represented in the network. Slightly more than half of the network members hold a South African nationality, which is a small majority (*see figure 11*). This is unusual for a network of this kind, compared to the other intellectual/scientific diaspora networks studied thus far, SANSA is the only network that has such a small number of expatriate nationals represented in the network. A number of network members also hold dual nationalities.

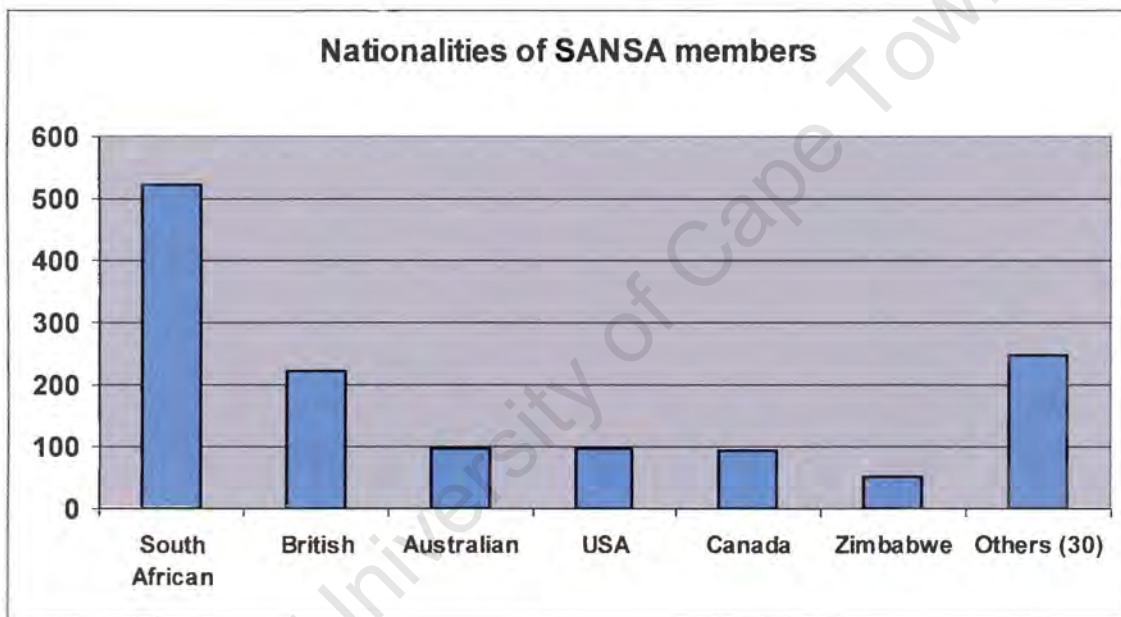


Figure 11

3) Qualifications and Expertise of SANSA Members:

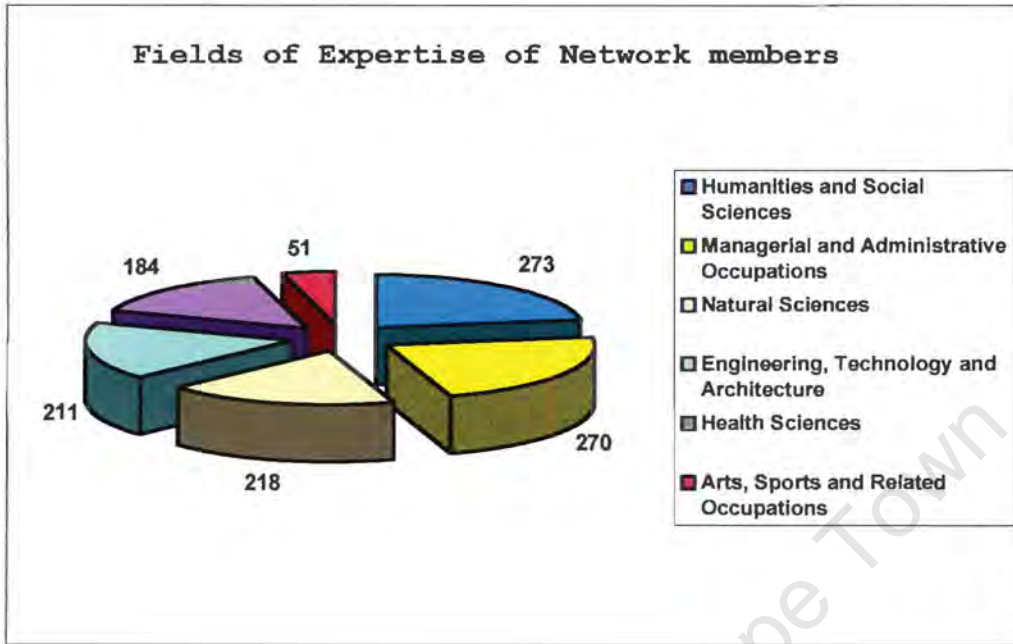
SANSA members are highly qualified with a significant proportion of them holding masters and doctorate degrees (*see table 8*).

Table 8

DEGREES	% OF SANSA MEMBERS
Diplomas	14.7
Bachelors	83.4
Post-Graduate Diploma	14.5
Honours	32.2
Masters	46.7
Doctorate	34.3
Post Doctorate	7.4

Members of the SANSA network are active in six fields of expertise with the majority of members in the fields of humanities and social sciences, managerial and administrative occupations, natural sciences and engineering and technology (*see figure 12*). Compared to the other networks studied so far where most of the network members are orientated towards the natural sciences, the SANSA network represents a wider scope of expertise and knowledge. This is especially true when one considers the fact that SANSA members indicated that they are active in over 30 disciplines (*see table 9*) and hundreds of specializations.

Figure 12



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HUMANITIES AND SOCIAL SCIENCES	% 27.3	MANAGERIAL AND ADMINISTRATIVE OCCUPATIONS	% 27	NATURAL SCIENCES	% 21.8	ENGINEERING, TECHNOLOGY AND ARCHITECTURE	% 21.1	HEALTH SCIENCES	% 18.4	ARTS, SPORTS AND RELATED OCCUPATIONS	5.1
Education Sciences	7.2	Company Governance and Administration	14.5	Biological Sciences	5.2	Engineering and Technology	16.4	Medical Sciences	14.2	Author	2.7
Philosophy and Psychology	4.5	Finance	9.5	Computer and Information Sciences	5.1	Architecture	4.8	Supplementary Medical Professions	2.3	Performing Arts	1.3
Law and Juridical Occupations	4.5	Marketing and Related Occupations	7.3	Earth and Environmental Sciences	4.2	Other (2)	0.2	Veterinary & Pharmaceutical Sciences	1.2	Plastic Arts	0.6
Sociology	4.3	Trade and Commerce	4.8	Agricultural Sciences	3.4			Dental Professions	1	Design	0.5
Economics	4.2	Human Resources	4.6	Physical Sciences	3.1			Other (3)	0.3	Sports	0.5
Linguistics and Literature	3.8	Industrial Production	3.3	Chemical Sciences	2.4					Other (2)	0.2
Accounting	3.8	Public Policy	2.4	Mathematical Sciences	2.2						

History and Geography	2.5	Other (5)	0.5	Other (3)	0.3								
Others (2)	0.2												

able9

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4) Purpose of the SANSA Network:

The idea of SANSA is born out of a realization that South Africa needs its highly skilled human resources to become internationally competitive and that its highly skilled diaspora represents a very important pool of human resources that the country can tap into. SANSA thus aims to mobilize highly skilled South Africans living abroad to get involved in the social and economic development of South Africa. SANSA aims to link these highly skilled South Africans living abroad to colleagues in the same fields and professions in South Africa as well as institutions and organizations in the country committed to the economic development of South Africa.

5) Activities of Network Members:

The SANSA project is not finished yet, so no real activities and actions have been generated as yet. Future activities however include allowing network members and other interested parties in the country access to the SANSA database so that they can look for potential partners and set up joint projects. Other possible activities include the creation of a electronic newsgroup and e-mail list for SANSA members which would allow them to communicate and share information as well as a newsletter which would keep members updated about the latest developments in the network.

Discussion of Research Results

The results of **the thelve scientific/intellectual diaspora networks** indicate that the diaspora option is a real and concrete phenomenon. Although these networks do differ on some characteristics, they share the same structure and format which confirms the point that the diaspora option is a definite and real phenomenon.

The **membership** of all the networks, except for ATPAC which is more of a regional network, is spread across the world in a number of different countries. This suggests that the term diaspora is indeed applicable to these networks. Some of the networks like the Caldas network and the Tunisian Scientific Consortium have a node structure which brings together members in a particular country. Although this is useful in that it facilitates closer interaction and communication between members, it is problematic in that these nodes tend to isolate themselves from other nodes as the case of the British node of the Caldas network clearly illustrates (Schlemmer et al:1997:5). This has important implications for the whole concept of network, a network usually consists of a number of interrelated and interconnected parts, but if these nodes are independent and isolated from one another, it suggests that in the Caldas network, local networking dynamics are more important than global ones.

The networks are also similar in terms of their organization and administration. All of them have a website which is the initial entry point for potential members as well as an on-line registration form which interested individuals can fill in(*see Appendix for an example of these registration forms*). These on-line registration forms although they differ in terms of structure and detail all

require the same kind of information, biographical data of potential members, their qualifications and expertise as well as their occupational details.

All the networks have a database in which members' data is stored and which also serves as an information tool where members can look for potential partners and network members in similar fields and geographical locations. The administration and organization of all the networks are handled by a board of directors which usually consists of network members.

All these networks appeal to the loyalty and commitment of highly skilled expatriates living in other countries. They all have as their main objective the economic and social development of the home country by involving highly skilled researchers, scientists and technologists living outside the country in this process of economic and social development.

All of the members are highly qualified and are active in the fields of science and technology. Most of these networks are orientated towards the natural sciences,. The SANSA and the BGN networks are different from these other networks in that they are more multi-disciplinary, a significant number of their members are active in humanities and social sciences as well as management and administration.

All these networks were created in the early 1990's and this is not coincidental. The development of intellectual/scientific diaspora networks coincides with the rise of the Internet at the beginning of the 1990's. This is not to suggest that the Internet is directly responsible for the development of diaspora networks. However, considering the fact that the Internet is the most important tool used by all these networks to facilitate communication and connection between network members as well as between them and the country of origin, it is not surprising that the

development of intellectual/scientific diaspora networks closely follows the development of the Internet. The Internet also plays a role in making these networks more visible, not only to expatriate nationals, but to the rest of the world. This highlights a contradiction inherent to this whole phenomenon, the Internet, which is a typical example of the globalization and internationalization processes is used to promote and facilitate a project which appeals to nationalist feelings of loyalty and commitment to a specific country.

All the networks studied consider themselves as independent, non-political and non-profitable organizations. Some of them like the Polish Scientists Abroad, the Association of Thai Professionals in North America and Canada, the Iranian Scientific Information Network, the Tunisian Scientific Consortium, The Brain Gain Network of the Philippines, the Arab Scientists and Technologists Abroad and the SANSA network all have links to some governmental institutions like the Department of Science and Technology or the Ministry of Education. This suggests that although these networks would like to maintain their independent character, some institutional support is necessary in order to generate action and concrete, purposeful activities to enable networks to fulfill their goals.

A number of these networks do require their members to pay a membership fee which is the main financial resource for the network. This suggests that these networks are indeed independent entities. Others like the Tunisian Scientific Consortium do get grants from private, government and international institutions. It is not clear whether this in any way interferes with the network's independent, autonomous character.

As far as the activities and actions are concerned some networks are "busier" than others. However all the networks organize similar activities to facilitate connection and communication

between members and the home country. These include e-mail lists, newsgroups and newsletters. A number of them notably ASTA, the Tunisian Scientific Consortium and the Brain Gain Network of the Philippines also organize workshops, seminars and conferences to encourage debate and exchange of ideas and knowledge between members. A number of joint research projects which ultimately benefit the country of origin have also come about because of these networks. The Bio 2000 and the automatics project of the Caldas network are excellent examples of such projects. It is clear that the organization of such projects is vital for the survival of any network. Members need to feel that they have a role to play in the realization of the goals of the network, in this case the economic and social development of the country of origin, and they also need to feel that they reap certain benefits from their participation in the network. Joint research projects not only benefit the country of origin, but also generate recognition for those involved in the projects. It is thus clear that the organization of activities and action is crucial to sustain the network, it is also an important measure of the success of an individual network. According to Schlemmer, "the set up of projects appears as the criterion for evaluation and the condition of their survival, while the association without a specific project dies" (1997:18).

The networks discussed in this report have all organized very specific and purposeful activities and actions. These projects are usually aimed at increasing connectivity between members and facilitating the transfer of knowledge, information and technology between network members and the country of origin. One can thus deduce from this that intellectual/scientific diaspora networks are useful tools in stimulating economic growth and development in the country of origin.

The diaspora option is useful in that it allows highly qualified expatriates to play a significant role in the development process of their home country, without necessarily returning home

permanently. They can stay in the host countries and are free to pursue their career objectives and at the same time give something back to their country of origin and also gain something for themselves in the process. Not only does the diaspora option allow the country of origin access to the knowledge and expertise of the expatriate, but also to the knowledge networks and resources that he/she has access to in the host country. Some of these expatriates have usually been outside the country for a good number of years and have established themselves in the host country, as is the case with most of the SANSA members. This means that through the members, the home country has access to all the resources, expertise as well as personal and professional contacts that the members have accumulated during his/her years abroad. This study of the intellectual diaspora networks have shown that the diaspora option is indeed a viable solution to the brain drain phenomenon. This is evident in the number of countries that have gone this route as well as the projects and activities that have been generated through these intellectual/diaspora networks. The diaspora option and repatriation are not mutually exclusive however. The diaspora option can be used as a strategy to enhance the economic performance of a country by getting its highly skilled expatriates involved in scientific innovation up to a point where the country will be in a position to offer these highly skilled scientists and researchers the incentives needed to attract them back to the country of origin.

The diaspora option although valuable, is not without pitfalls. As was argued before, action and activities in the forms of joint scientific research projects are needed to guarantee the survival of the network and to ensure that network members remain interested in being a part of the network. There also has to be a concrete system of information sharing and communication between members and between them and the country of origin. The Internet plays a vital role in ensuring this. This analysis has also shown that some links with certain governmental or non-governmental and business institutions are necessary to ensure the sustainability of research

projects and ultimately the survival of the network. One of the most successful networks in terms of actions and activities, is the Arab Scientists and Technologists Abroad Network (ASTA). This network although independent has cooperative relationships with a number of universities, other organizations like UNESCO, the Higher Council for Science and Technology, the Ministry of Education, etc. Another important element is the existence of a governing body which coordinates and manages the activities of the network. All of the networks studied, have a board of directors which is responsible for the administration and organization of the network. Although, ideally, one would like the network to be as decentralized as possible, I believe that a central body is needed to coordinate and manage the running of the network and the interaction between network members and between them and interested parties in the country of origin.

In this section the different networks have been compared in terms of their structure and operation. I have also shown how the diaspora option is a useful tool in counteracting the brain drain phenomenon. I have discussed the advantages as well as the possible pitfalls associated with the diaspora option. My study of the different intellectual/scientific diaspora networks has lead me to conclude that the diaspora option, if managed correctly is a viable solution to the brain drain phenomenon.

CONCLUSION

Historically certain theories have led to a perspective of the brain drain as a win/lose situation between developed and developing countries which in turn have led to specific responses to skills migration.

Over the years many strategies have been implemented with variable success to counteract the brain drain. Many countries have thus tried a new strategy, "the diaspora option" to deal with the brain drain issue. The aim of this project was to study the experiences of countries that have implemented the diaspora option and to see whether the diaspora option is a viable solution to the brain drain phenomenon.

The first step was to identify the countries that have actually set up intellectual/scientific diaspora networks. The diaspora option is however quite a recent phenomenon which means that not much information is available on the topic. The Internet thus proved an invaluable source of information, because the majority of these networks make use of the Internet as the main tool for marketing the network as well as connecting network members to the country of origin. After six months of intensive and systematic Internet searches 35 networks were discovered. Although all these networks have in common the goal of fostering closer connection and communication between expatriates and the country of origin, they can not all be classified as intellectual/scientific diaspora networks. It was thus decided to only focus on thirteen networks since they fit the description of intellectual/scientific diaspora networks more closely.

These networks were analyzed and compared in terms of their organization and administration, the geographical location, skills and qualifications of network members, the purpose of the network and the activities that the network members engage in. This comparison highlighted the fact that although these networks differ on some minor details, they all share a similar organizational structure and format. It was thus concluded that the diaspora option is a real and tangible phenomenon.

They all have share the same purpose of using the intellectual diaspora of the country to contribute their skills and knowledge to the social and economic upliftment of the country of origin. This is done by finding ways of linking network members as well as linking them to persons in the same fields and professions and other interested institutions and organization in the country of origin. The network members of all these intellectual/scientific networks organize and engage in various activities to ensure that the above-mentioned goals are met. These activities and actions are important for the sustainability of the network.

Although some of the networks organize more activities than others, they all have clear direction with regards to the attainment of the goal of advancing the country of origin economically and socially. This has led me to conclude that the creation of intellectual/scientific networks is a viable solution to the brain drain issue, provided that these networks are manage correctly. The most fundamental conclusion that I have come to on the basis of the study of the thirteen intellectual/scientific diaspora networks is that the brain drain phenomenon is no longer as detrimental as many theorists have led us to believe. The diaspora option is a successful measure in counteracting the brain drain. What makes the diaspora option such a favorable strategy is that highly qualified expatriates don't have to return to their country of origin in order to contribute to the country's economic and social advancement, they can still do that while remaining in the host

country. Also, the diaspora option allows the country of origin access to not only the knowledge and skills of the expatriate, but also the knowledge-networks that he/she forms part of in the host country.

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BIBLIOGRAPHY

Books:

Charum, J & Meyer, J. (1998). Hacer ciencia en un mundo globalizado

La diaspora científica Colombiana en perspectiva. Tercer Mundo

Editores, Santafe De Bogota

Choi, H (1995) An International Scientific Community- Asian

Scholars in the United States. Praeger, London

Cohen, R (1997) Global Diasporas, An Introduction. University

of Washington Press, Seattle

Granovetter, M (1990). The Old and the New Economic Sociology, A

history and an Agenda, in Friedland, R and Robertson, A (eds)

Beyond the Market Place. Aldine de Gruyter

Granovetter, M (1991). The Social Construction of Economic

Institutins in Etzioni, A and Lawrence, P(eds) Socio-Economic

Sociology: Towards A New Synthesis. M.E. Sharpe, New York

Granovetter, M & Sweberg, R(1992) The Sociology of Economic Life.

Westview Press, San Fransisco

Manchuelle, F (1997) Willing Migrants, Soninke Labor
Diaspora. James Currey Publishers, London

Mouton, J (1996) Understanding Social Research. J.L. van
Schaik Publishers, Pretoria

Pappi, L & Laumann, E (1976) Networks of Collective Action, A
Perspective on Community Influence Systems. Academic Press, New
York

Schulze, K et al (1996) Nationalism, Minorities and Diasporas,
Identities and Rights in The Middle East. Tauris Academic
Studies, London

Van den Broeck, J (1996) The Economics of Labor Migration. Edward
Elgar Publishing Ltd., United Kingdom

Webster, A (1990) Introduction to the Sociology of Development
2nd Edition. Macmillan Press Ltd., London

Journal Articles:

Fischer, M.M (1989) New Scientific Cooperation Across Europe: the
ESF Scientific Network Initiative; . Environment and Planning A,
Vol.21

Foner, N. (1998) West Indian Identity in the Diaspora: Comparative and Historical perspectives, Latin American Perspectives, Vol.25

Gaillard, J and Gaillard, A (1997) Introduction: The International Mobility of Brains: Exodus or Circulation. Science, Technology and Society, Vol. 2

Kaplan, D. (1997) Reversing the Brain Drain: The Case for Utilizing South Africa's Unique Intellectual Diaspora, Science, Technology and Society, Vol.2

Kersteven, G.L. (1983) The Flow of Information and transfer of knowledge, Impact of Science on Society, no.3-4

Leistner, E (1993) Migration of high-level African Manpower to South Africa. Africa Insight, Vol.23

Mda, L. (1995) Leaving Home. Tribute

Meyer, J. et al. (1997) Turning Brain Drain Into Brain Gain: the Colombian Experience of the Diaspora Option. Science, Technology and Society, Vol.2

Muller, T (1991) Educational Labour Flows to South Africa. Matlhadesi, Vol.10, Issue 1

Murdoch, J (1995) Actor-Networks and the evolution of Economic forms: Combining Description and Explanation in theories of Regulation, Flexible Specialization and Networks. Environment and Planning A, Vol.27

Rosenbaum, J et al (1990) Market and network Theories of the Transition from High School to Work: their Application to Industrial Societies. Annual Review of Sociology, Vol.16

Solso, R (1987) The Social Political Consequences of the Organization and Dissemination of Knowledge. American Psychologist, Vol.42

Articles From the International Symposium on Scientific Migration:

Cardoza R & Villegas R (1997) Scientific Migrations, Cooperation and Development Networks in Latin America and the Caribbean

Charum, J (1997) Migration and the Construction of Scientific Cooperation. The Case of the Caldas Network

Henchi, B (1997) Tunisian Experts Abroad: A greater Contribution To National Development

Murcia C & Parrado L (1997). Labour Migration of Highly Qualified Colombians: The Experience of the Caldas Network

Meyer, J (1997). The Satellite: Towards A Local and Global Observation of the Circulation of Competence, Synthesis Session of the Symposium

Pederson P and Lee K (1997). Running Head: Back-and-Forth Perspective: "Back and Forth" as a Viable Alternative to the Brain Drain Perspective with Chinese Examples

Pellegrino A and Cabella W (1997) Emigration of Scientists: The Uruguayan Case

Schlemmer, B et al (1997). The Dialectics of the Virtual and the Real in the Caldas Network of Colombian Researchers Abroad

Internet Articles:

Association of Thai Professionals in America and Canada

<http://www.eardc.swt.edu/~atpac/>

Association of Nigerians Abroad

<http://www.rain.org/~anenet/>

Colombian Network of Researchers Abroad- Red Caldas

<http://www.bio.cam.ac.uk/>

Global Korean Network

<http://monextech.co./gknc/>

Iranian Scholars Scientific Information Network

<http://ux1.cso.uiuc.edu/>

Irish Research Scientists' Association

<http://www.irsa.ie/>

The India Network Foundation

<http://www.indnet.org/>

The Brain Gain Network

<http://www.bgn.org/>

The Network of Arab Scientists and Technologists Abroad

<http://www.physics.uiuc.edu/~m-nayfeh/asta.html/>

The Polish Scientists Abroad

<http://www.opi.org.pl/>

The Tunisian Scientific Consortium

<http://www.menet.umn.edu/~TSC/>

Worldwide Indian Network (WIN)

<http://theory.stanford.edu/>

Lachmansingh :Guyana: The Brain Drain Phenomenon

<http://www.tuns.ca/~allenc>

Straubhaar T. (1998). Brain Drain and Brain Gain in East Europe: An Evaluation of the East European Migration to Germany

<http://migration.ucdavis.edu/>



The Sending Countries, the Immigrants Themselves and the World as a Whole

<http://www.geog.umd.edu/>

Other Sources:

Brain Drain : A Review of Alternative Perspectives

Cohen, R Brain-Drain Migration- Background Research Paper prepared for the Green Paper on International Migration

Kaplan D (1997) Migration of the Professional, Semi-Professional and Technical Occupations in South Africa: Past Patterns, Current Trends and Policy Central Statistical Services (1960-1997) South African Statistics

University of Cape Town

APPENDIX

1. Copy of On-line Registration Form
2. Copy of SANSA Information Pamphlet

University of Cape Town



APPLICATION FOR A. N. A's MEMBERSHIP

About A. N. A Membership...

- a. Membership is open to Nigerians and non-Nigerian citizens who have genuine interests in par contributing to the activities of the Association;
- b. Application for membership shall be in writing to the General Secretary of the Association;
- c. Each application is reviewed by the Executive Council;
- d. An active member of the Association shall be a member who is not delinquent in payment of dues.

MEMBERSHIP RIGHTS

- a. Access to the ANA-Net <receptionist@ananet.org>
- b. Participation in ANA deliberations;
- c. Active members shall vote, or be voted for into elected offices, or appointed to any vacancies

MEMBERSHIP FEES

- a. Regular Membership - \$50 USD annually.
- b. Student Membership - \$25 USD annually.

Completed form is to the attention of A. N. A's Membership Committee

Please complete the following form:

A. PERSONAL DATA

	Names (SURNAME, FirstName, Others)
	E-mail address
	Telephone (<i>with international code</i>)
	Telefax (<i>with international code</i>)
	Postal address
	Country of Residence
	Profession/Occupation
	If student, field of study
	Are you a Nigerian CITIZEN ?
	Citizenship, if not Nigerian?

Are you 18 years old or above?

B. ANA ATTRIBUTES

How did you come to know about the ANA?

The ANA Charter, states in part:

"The Association shall be non-profit, non-ethnic, non-religious, and non-partisan in al with the people and Government of the Federal Republic of Nigeria and the outside wo the Association shall, as and when necessary, advocate for democratic ideals, human r law, fairness, justice, and equity in Nigeria and for all Nigerians"

Is the position expressed above consistent with you position?

- YES
 NO

If it is not, please explain:

Name of current employer:

Name of previous employer:

Are you a member of any organization (excluding professional bodies) whose activities and interests encompass Nigeria?

- YES
 NO

If yes, please state the name of the organization:

Do you have any political affiliation?

- YES
- NO

If yes, please state it:

Please briefly state your interest in ANA and Nigeria

C. ANA PROGRAMS

The ANA is a goal-oriented association. Each member is *expected* to contribute actively to the ANA objectives. This is done by active involvement in Committees that suit your skills and interests.

If your membership application is approved, which Committees do you intend to join? Please tick/check appropriate:

[We recommend no more than two]:

- Education Committee
- Technology Committee
- Public Relations Committee
- Finance Committee
- Rules Committee
- Election Committee
- Fundraising Committee
- Political Affairs Committee
- Health Issues Committee

Select ANA membership type:

- Full
- Associate (*for non-citizens*)

I hereby declare that the information I have provided in this e form is true to the best of my knowledge and I have accepted as a member or associate member. I will abide by all the rules and regulations of ANA.

Send the completed form

Clear the form

Dear Madam / Sir

This is a letter of invitation - to join the South African Network of Skills Abroad (SANSA).

South Africa is currently undergoing major transformations as the country wrestles with a range of developmental challenges. A major constraint is our lack of skilled persons. At the same time there are highly skilled South Africans located all over the world.

SANSA aims to create a network for all skilled people living abroad, in whatever domain: academic, cultural, commercial - whatever their skill and experience, who wish to use such skill and experience to participate in the development of South Africa.

SANSA has the strong support of the South African government and is also supported by many prominent South Africans now located abroad. (Refer to endorsements at the back.)

You will find the following enclosed:

- 1. A short description of what SANSA is and what it hopes to do.*
- 2. An Information Data Sheet for you to fill out, if you wish to join the network.*

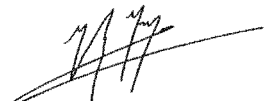
The electronic version of the questionnaire is available on our website. If you can, we would recommend that you complete the electronic version as this captures all of your data quickly and automatically. Should you wish to e-mail, fax or post your answers, these methods would also be acceptable.

The information you provide will be for the exclusive use of the SANSA network. It will allow you to be ultimately connected to others, in South Africa and abroad, who wish to work together with you. You will be free, at any stage, to limit access to any of the information you give and you will be able to change or update this if necessary. Furthermore, you will always have access to your own data. You can withdraw from the network at any stage. SANSA belongs to you and it is for you alone to determine exactly how you participate in it.

We wish you the best in your activities and we look forward to maintaining contact with you.



David Kaplan



Jean-Baptiste Meyer

What is SANSA?

The South African Network of Skills Abroad links skilled people living abroad who wish to make a contribution to South Africa's economic and social development and connects them with local experts and projects.

Why this initiative?

The lack of highly skilled people in South Africa is a major constraint to the country's development. However, there are large numbers of highly skilled South Africans now living abroad. The human resources of this "diaspora" could contribute significantly to the achievement of South Africa's cultural, social and economic goals.

Who can be a member of the network?

Anyone, in any field, who has skills and is interested in contributing to the new democratic South Africa. The network is not restricted to former South Africans now living abroad, but it is principally directed at them.

Who is initiating the network?

This initiative is a joint venture of the Science and Technology Policy Research Center (STPRC) and the French Institute of Scientific Research for Cooperation and Development (ORSTOM). The STPRC is a leading South African research center in S&T policy and ORSTOM is a French organisation which has recently been engaged in similar initiatives in Latin America.

Who supports the network?

The network has been formally endorsed by the Department of Arts, Culture, Science and Technology. It has strong support from universities and science councils and from prominent South Africans - in South Africa and abroad.

What contribution can I make?

Members of the network will decide on the nature of their contribution. However, the experience of similar

networks in other countries gives some indications, including:

- receiving South African graduate students in laboratories, or training programmes
- participating in training or research with South African counterparts
- transferring technology to South African institutions
- transmitting information and results of research which are not locally available
- disseminating cultural and artistic creation
- facilitating business contacts
- initiating research and commercial projects.

What is the first step?

The gathering of basic information about the diaspora members and their potential contributions is the starting point for the network. A basic information data sheet has been prepared for this purpose and can be filled out either manually or electronically.

What will happen next?

The data will provide the information necessary for building the network. Analysis of the data will reveal the areas and disciplines in which South African experts abroad are active and how these can best be matched to local needs. With this information, network members will be able to establish connections and develop activities appropriate to their fields.

What should I do?

You can fill out the information data sheet, if this is relevant in your case. You can also inform others whom you think would like to be involved, as well as forward to us the names and addresses of potential members of the network.

This original project is now underway. You have the opportunity of participating in its exciting developments.