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Building Sustainability: The New Frontier of Diaspora Knowledge Networks

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Abstract:

The diaspora knowledge networks (DKN) – associations of highly skilled expatriates willing to contribute to the development of their origin countries- have emerged in the 1990s. They provide a new option with regards to 3 policy areas: Innovation/S&T, Migration and Development/Cooperation, for both the North and South.

A new actor in the recent and developing transnational arena, DKNs have been received with some suspicions, doubts and even criticisms on their real, effective ability to perform a development role.

Recent evidence convincingly dismisses excessively skeptical approaches and shows the actual and potential importance of such kind of networks. They are numerous and many of these, especially in Asian cases, have had an outstanding positive effect. A survey of existing visible DKN and historical analysis on the Indian IT growth and expansion do show the original and irreplaceable developmental action of these networks.

However, the experience also shows the erratic activities, limited results and precarious life of many DKN. This fact does question the dynamics of such networks: do they have autonomous effects or are they strictly context dependent? What are the market and/or policy impacts on their developments?

This presentation draws on the actor/network sociology to explore the way that action shapes the context and therefore results of transnational activities and relations in the making. In particular, the theory of translation and the concept of interestment (*intéressement*) are used to explain constructive strategies for DKN.

In the process of building sustainable diaspora networks, traditional entities – such as state, national organisations, public local institutions as well as firms, NGOs and intergovernmental organisations- may be involved. They can find there a new field of expansion and the reproductibility of some DKN' successes is a challenge for all.

I - New evidence on diaspora knowledge networks

Today, the data collected about highly skilled diaspora networks overcomes most of the limitations pointed at by various authors (Lowell and Gerova 2004, Lucas 2004). These data come partly from a systematic analysis of hundreds of websites on the one hand, and from specific studies of Asian diaspora networks on the other hand (Meyer and Wattiaux 2006, Leclerc and Meyer 2007).

The case of China and India are among those most developed and a few lessons may already be extracted of their detailed description (Xiang Biao 2006, Leclerc and Meyer 2007). However, this ADB study deserves more analysis and comments as it brings a wealth of interesting materials and perspectives, to be compared with other studies on other countries in Asia as well as in other parts of the world. Among the points more specific to the Chinese case which explain the magnitude and success of its highly skilled diaspora mobilisation, the following may be emphasised:

- estimate of the population of OCPs (Overseas Chinese Professionals) in the world is about 1 million with high concentration in North America;
- there are more than 200 registered associations of these OCPs registered by the OCAO (Council for Overseas Chinese Abroad Office);
- a definite policy (*wei guo fuwu*) has been set up in the late 1990s promoting linkages with talents in the diaspora;
- 5 ministries and a high number of provincial governments agencies as well as parastatal entities are involved in programmes and activities with highly skilled expatriates;
- short term visits, collaborative projects between OCPs and home academic communities, senior expatriate scientists lectures in China, occasional technical advice, local recruitments through big fairs or more selective encounters are part of the many activities displayed by the diaspora and counterparts in China.

The role of the associations of OCPs, whose number has increased during recent years, seems a key factor in the expansion of links between formal and informal networks. The internet happens to be the major media used by OCPs to stay connected with the country and among themselves.

Summarising the major conclusions of this study, it appears that the Chinese case strongly confirms the great number and current expansion of highly skilled expatriate associations, their real intensity of activity as well as their responsiveness to policy factors. The question that remains to be solved is more on the transformations it generates in the countries of origin, on the developments of which it may -or not- be the impulse. Contradictory explanations have so far been given, on the case of India and China.

The role of the diaspora in the Indian IT industry's developments has been particularly discussed during the past few years. Scholars unanimously think this role has been important, especially in lowering reputation barriers to trade, but divergences are recorded with regards to the priority given. Some authors (Lucas 2004, Kapur and Mac Hale 2005) subordinates the expatriates' input to local factors in India (mainly cheap highly skilled labour), while others see the intervention of prominent NRI and associations in the United States as crucial and determining (Saxenian 2002, Khadria and Leclerc 2006). However, as in the case of the underestimated numbers of diaspora networks, the evidence tends to increasingly prove the key role of diaspora entities. Anecdotal evidence of NRI IT executives and entrepreneurs in America shows, indeed, their direct involvement and original contribution in high level activities development in Bangalore and other industrial places (Pandey et al. 2006). Strategic transformation in the field in India with the branch moving up the value chain from low to high skilled activities appears to be directly related to diaspora initiatives combined with the return of well trained IT employees after the slow down of activities in the USA in the early 2000s (Warrier 2006). Micro level and historical records of Indian IT firms reveal that a real transfer of technology has taken place, with India capturing knowledge intensive and competitive parts of the production process from expats (Leclerc and Meyer 2006).

The Indian high tech sector's development is correlated to the impressive expansion and intensity of professional associations of NRI IT specialists and engineers in the United States and in California in particular. As mentioned above (see figure 4) India ranks first among the countries with Diaspora Knowledge Networks working for the development of origin countries. Moreover, to these DKN with clear transfer and development purposes, should be added the many professional associations serving the careers, entrepreneurial, business endeavours and networking activities of Asian/Indian community members in the US. The profusion of actors and intermediaries makes this milieu extremely dense and fertile. This situation is matched in India where national and local governments as well as universities, technology institutes, professional associations, federations, commissions, and chambers of commerce are very present and active. Between India and America, continuous circulation of human and material agents feeds both poles with complementary tasks and ob-

jects. Interactivity in this multiple and dispersed milieu is ensured by a systematic and creative use of computer mediated communication. It is such a basic existential attribute that the absence of personal blog is, for instance, sarcastically described as a prehistoric situation.

II – Dynamics of Highly Skilled Diaspora Networks

The increasing evidence about diaspora knowledge networks has gradually made possible more precise analysis of their results or shortcomings. A number of academic research or cooperation agencies' works have brought a diverse set of case studies useful for assessing the strengths and weaknesses of the brain gain diaspora option: on the Colombian Caldas network (Meyer et al. 1997, Charum and Meyer 1998 and 2000, Chaparro et al. 2004), on the South African Network of Skills Abroad as well as the South African Diaspora Network (Brown 2003, NRF 2005, Castro Sardi 2006, Marks 2006), on the Latin American early experiences (Lema 2003), on Argentina's various attempts (Kuznetsov, Nemirovsky and Yoguel 2006), on the Indian numerous examples (Khadria 2003, Leclerc and Meyer 2006, Pandey et al. 2006), on the Philippines (Opiniano and Castro 2006) and Afghanistan (Hanifi 2006), on Armenia (Minoian and Freinkman 2006), on the huge Chinese diasporas (Yugui Guo 2003, Xiang Biao 2006) and on synthesis compiling various of these contributions and others (Barré et al., Institut de Recherche pour le Développement, 2003; Westcott, Asian Development Bank, 2005 and 2006; Kuznetsov, World Bank Institute 2006).

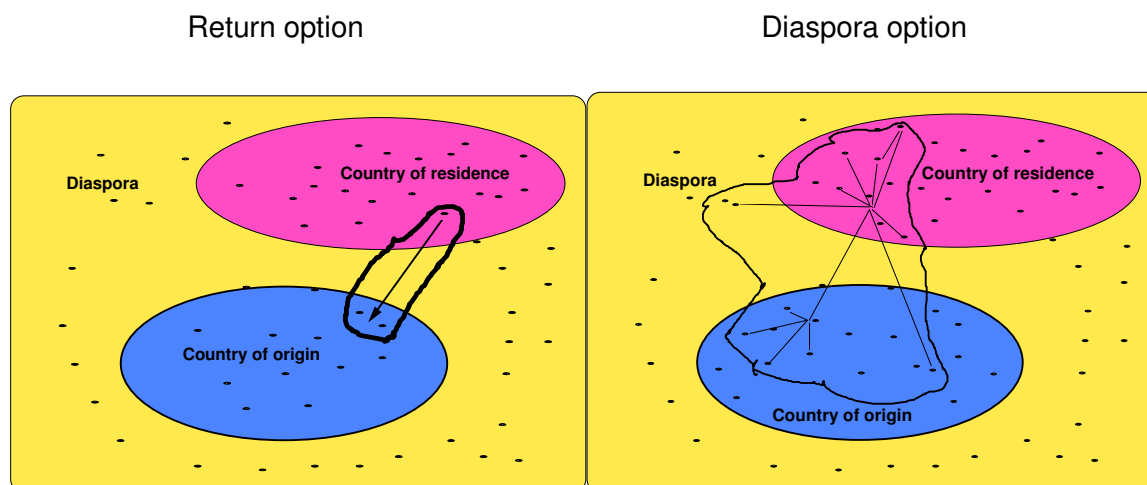
It is time to capitalise on this harvest of case studies, not only in an evaluation perspective through comparative analysis of individual experiences with successes and failures but also by drawing systematic lessons from these many stories and conceptualising the general dynamics at work in this diasporic scheme. With this overall understanding of particular situations we might be equipped to think about proper networks configurations and modalities.

Common logics of DKN

The DKN are very diverse. However, they are all built on the same basic objective: to take advantage of expatriate networks and human resources for the benefit of the origin country. The logics to which they all respond is thus one of networking and connectivity. This is what makes the diaspora option very much distinct – though complementary- from the return option (figure 6). The former relies on permanent repatriation of individuals' human capital to be

physically reinserted in the local environment while the latter mobilises the expat's networks through the single actor with whom direct contact is made. There is, thus, a multiplier effect.

Figure 1: Return and diaspora options

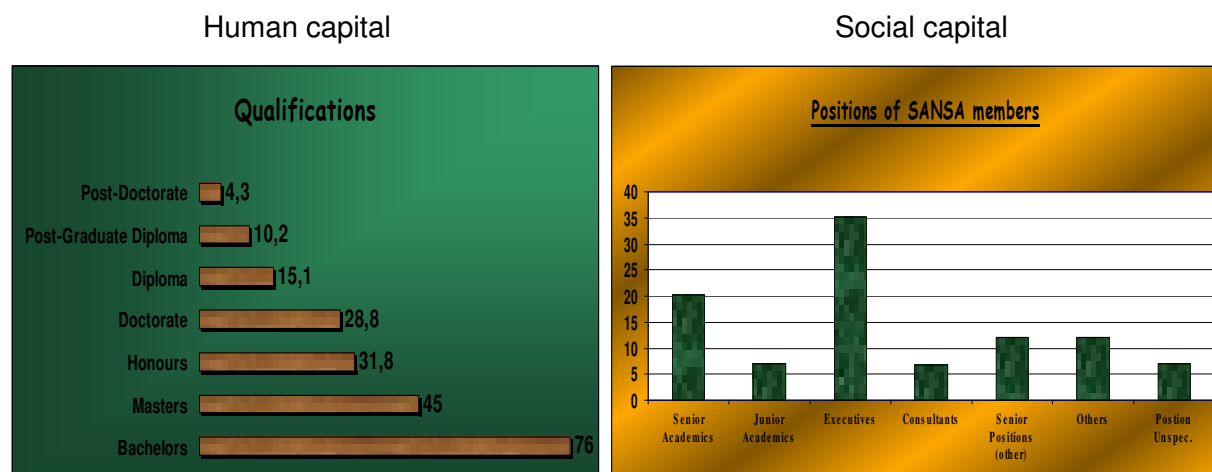


The networks of these expatriates are very diverse in nature : scientific, technical, institutional, professional, financial, etc. What make the expatriate particularly valuable, indeed, for its country of origin, are obviously the skills displayed in his/her cognitive activities and made available at home, but also the path to equipments and facilities unavailable locally, the status, credibility and peers recognition attached to formal employment in a firm or lab of international visibility and thus provided to a peripheral one without any cost, the access to major funding programmes (see US-NSF cases in Johnson 2003, EU multilateral projects in Granes and Morales 2000), the introduction to markets especially through the integration of procedures, standards and quality assessments (see Lucas 2004), etc.

It is often said that, through the diaspora option, the country of origin is able to access the social capital accumulated by the expatriates. However, this refers to an extensive version of social capital, much more than simply interpersonal relations. It includes obviously human capital (Becker 1962) but also intellectual capital (Stewart 1997), symbolic and cultural capital (Bourdieu 1979), institutional (Rey Valette 2004), technical, physical, financial capitals as well, since equipments, infrastructures and money are susceptible of being mobilised too. In the case of the South African network of Skills Abroad, some of these have been estimated. Human capital and social capital indicators have been defined, in a reductive though analyti-

cal manner¹. The diploma and the socio-professional positions have been chosen as proxies, respectively for the former and the latter (see figure 7).

Figure 2 :



Both capitals are very high in the diaspora: the rate of Phds is twice as much as in the equivalent qualified population at home (figures of the year 2000); the proportion of higher positions in professional hierarchy among the expatriate professionals is about 3/4.

While the former (human capital) requires the reconstruction of an adequate context in order to be intensively used if repatriated, the latter (extensive social capital) may be available in a remote manner.

The goal, for the country of origin, is to tap the expatriate professionals and the resources connected to them. Due to the executive positions and power these professionals hold, their capacity to mobilise important resources is globally very high, making the potential multiplier effect quite effective. For such reasons, the involvement and commitment of even a small number of expatriates may be decisive, as shown by anecdotal evidence on other diasporas (for instance on the case of Chile, see Kuznetsov 2006, 5-6).

¹ The notions of human and social capital are controversial and should therefore not be taken for granted. Their use here does take into account the interpretative flexibility allowing their utilisation though with critical distance. On the latter see Meyer 2001 and Meyer et al. 2001.

In terms of social capital approaches, DKN exhibit the 3 properties mentioned by some theoreticians (proposed by Woolcock 2000). Bonding comprises the internal relationships within the network tending to build up a community. Bridging refers to those associating distant and asymmetrical partners of different countries. Linking happens among the many peers connected through the network. According to Brinkerhoff (2006a, 2006b), the 3 properties are very much interdependent in the networks dynamics: bridging may be efficient because bonding is strong. The confidence acquired among members reflects in them giving access to third actors, for example.

The evidence also demonstrates that in most cases, a significant part of the highly skilled expatriates are willing to help their country of origin. The individual motivations may be quite diverse: guilt feeling of having left and ‘made fortune’ away; activist commitment or sentimental rememberings; opportunities to keep in touch with relatives; expectations about professional developments; social or entrepreneurial expansion; occasion of international connections and cooperation agencies support; etc... Whatever the reasons, the diaspora members are, in principle, sensitive to the home country’s situation, open to its solicitation and available for cooperation. Eventhough only a fraction may actually respond to its call, the occasionnal survey of non respondents have shown that there was actually less profound disinterest than simple ignorance or unawareness of home country’s moves. The desire for networking, therefore, usually comes from both sides: the diaspora and the place of origin.

The motivation behind DKN creation, development and the commitment of their members deserves deeper explanations. The mutually reinforcing process between human and social capital has been pointed at (Helliwell and Putnam 1999, Denny 2003) and the highly skilled expats propensity to gather and build associations fits with this pattern (Banks and Tanner 1998, Gibson 2001). However, at the same time, the opportunity cost of professionals to get involved durably into non profit activities is comparatively high (Brown and Lankford 1992). This also corresponds to what happens in many DKN: to keep the highly skilled expats in the network is difficult; more than to get them in, because their time is relatively less available than for other working or non active persons. Underproductive endeavors are thus quickly punished with an “exit” from those who might have embarked initially with enthusiasm.

However, beyond individual dispositions, there is an interesting collective process which is at work in the constitution of DKN. As mentionned by Brinkerhoff (2006b), the identity expression in such networks is very important. Our own results on Colombian and South African networks have shown that these identity expressions are very much constructed by the very actors when they decide to get involved in the network (Meyer et al. 1997, Meyer, Kaplan

and Charum 2001). In such a constructivist approach to identity shaping, the role of communication technologies is crucial (see next section).

The identification of the professional expatriates to their country of origin is a product of networking through DKNs. However, it does correspond to a phenomenon rather classical in sociology. The labour market, traditionally regulated and bounded by national borders, is a very strong driver of national identities (Gellner 1983). It is therefore not surprising that the recognition –by origin countries- of professional abilities, crucial in the shaping of professional identities (Dubar 1991), generates in return an extension of the latter to the national origin sphere. It is a re-identification through professional motives. This finding points to an important fact: identification processes are dynamic and action related. They are tied to current work activity more than to passive cultural remnants. This is especially so for cognitive professional practice. Knowledge production and development are indeed activities in which identitarian processes through collective projection into the future are very high (Meyer 2006). The new diaspora of scientists and engineers have contributed to highlight this phenomenon in an unexpected manner (Meyer 2004a). The increasing awareness of the importance of knowledge in development processes, stimulated by the emerging national systems of innovation in developing countries, as well as the opening to international winds by these countries in the 1990s - Argentina, Chile, China, Colombia, India, being good examples of such policies- have vivified an active re-integration process between the diaspora and the origin countries. This new integrative approach is coined as an actual policy process by Gamlen (2005).

Networks sociology

The dozens of networks mentioned have almost all been created in the 1990s and 2000s, and are indissociable from the expansion of Arpanet, Bitnet, then Internet. The role of ICTs has been absolutely crucial in the spontaneous emergence of such DKNs in a humanly non coordinated though convergent manner. Even when traditional associations preexisted the constitution of actual DKN, the introduction of computer mediated communication boosted their activities. For all the networks registered in this database as well as for all the others known by other sources, the Internet is the major way, and by far, of exchanging information. In specific cases where the development of both internet and a single DKN coincided and could empirically be tracked and reported, the dynamics have shown that the electronic media have definitely been fundamental in the creation of the social entity (Granes and Meyer 2000). In the Caldas network, for instance, the email lists, news groups and institutional

nodes have permitted to identify diaspora members, to contact them for an initial and often successful 'recruitment', to mobilise their own networks, to provide a permanent common space shared by all, to build on complementarities with the Colombia based communities, etc...

At the same time, however, the tremendous input of the ICTs in the DKN process had an ambiguous effect. The proliferation of messages of all sorts, sometimes with few substantial matters, occasionally with controversial debates on sensitive issues with respect to the country of origin, led to excessive noises. Like in the R-Caldas, it sometimes exhausted the founding fathers motivation, spoilt their energy by endless and sterile discussions, suffocated members potential initiatives in useless fora and generated bitter comments spurring further controversies and acrimony. In that sense, if the ICTs and internet have, without any doubt, been crucial in the development of DKNs, it may also be said that they caused many of these networks' growth problems. These are no different from traditional problems in communication studies (noise, conflicts, misunderstandings, accusations, echoes, amplification, rumours, etc.). But they precisely expanded because communication happened to be disconnected from action. In the Caldas network for instance, the coincidence between the proliferation of discussions within the R-Caldas list and the drying up of political initiative from Colciencias - initially the major stakeholder- in the network development after the mid 1990s, is of striking evidence.

The South African Network of Skills Abroad, though organised in a very different manner, exhibits similar deficiencies. Drawing lessons from the Colombian shortcomings in communication tools, it was thus provided with efficient instruments (Website, newsgroups, forum, email list, bulletin board, etc.) for its 2500 members located in 65 countries (Brown 2003). After 5 years, the agency managing the network concludes with a sub-utilisation of these resources (NRF 2005). The reason may be attributed to a lack of animation, human agency in these socio-technical networks being absolutely crucial (Turner et al. 2003). In this deficient human agency, more than administrative capacity and attention, the responsibility of weak political engagement may be underscored, like in the case of Colombia.

This is where an appropriate theory of action becomes useful, in order to understand what is needed to develop and sustain such new associations as the DKN ones. The sociology of science and technology or sociology of innovation has proposed a new conceptual framework with the actor-network theory developed during the last 20 years. It is extremely relevant for such objects of analysis as the Diaspora Knowledge Networks. The actor-network

theory is based upon 4 concepts: problematisation, interestment, enrolment and mobilisation (Callon 1986, Latour 1987, Law 1999, Latour 2005). These concepts constitute the translation process through which socio-technical change may happen. Such a process may be described and made visible through dynamic mapping instruments (Callon M., Courtial J.-P., Turner W. 1991, for the theoretical and methodological approach and various chapters of the present volume for DKNs more specifically). In brief, for an innovation to succeed, those who create it (scientist, entrepreneur, R&D department, etc.) must reformulate a problem in adequate terms, get the interest of entities susceptible of choosing the new path, enroll the allies (humans and non humans) who will define the new standard, mobilise and channel the resources and actors along these new lines, making these gradually irreversible. Thus, the innovation process is not the result of a self-imposing logic or natural diffusion of a superior artefact; it is a struggle between on the one hand, existing entities and networks and on the other hand, those trying to get relevance and momentum in order to make their own place below the sun. Therefore, in many ways, innovating means a dissociation of a previous configuration, capturing actors and building a network in which these will hold together in a new manner. Through problematisation, interestment, enrolment and mobilisation, there is thus diversion of previous elements and their associations to the benefit of new consortia.

This approach fits with the DKN situation. Let us examine more precisely what happens with the diaspora option presented in III-1. In this scheme, the expat is an actor-network, condensing his/her connections (social capital) in oneself. The DKN purpose is to capture this actor-network and divert him/her towards the home country, which is itself, at least potentially, a consortium of networks. In this sense, in order to realise the translation process, DKN must perform the problematisation, interestment, enrolment and mobilisation operations. In fact, today, most of the existing DKN may be considered as having succeeded in several of these operations, mainly : problematisation, mobilisation and enrolment. The experience shows indeed that the 3 have often been accomplished.

a) Problematisation

The problem of skills circulation has been successfully reformulated, with the shift from brain drain to brain gain during the last decades. With the latter has emerged a vision in which the possible reconnection has become a workable and promising option. Today, neither a single country nor an international organisation would reject the possibility of networking with expats in a systematic manner and this opens opportunities for many DKN.

Many expatriates have implicitly or explicitly acknowledged their potential contribution to their country of origin, meaning that they were no longer unreachable and could be available for

projects run by their fellows back home. This is an actual, pragmatic, individual brain gain stance, instead of the previous permanent expatriation scheme that used to prevail in these people's mind. Personal interviews show this historical reformulation of mobility as a life experience vs definite farewell to the place of birth. A crucial shift in this reformulation has been the introduction of internet communication, as a reconstruction of continuity between separate places and sequences of time.

b) Mobilisation

All the cases where real attempts of setting up networks have been impeded did manage to gather a significant number of expatriates. The extent of the mobilisation does vary considerably from one network to the other, from country to country, but the message of call from home has proven to be appealing to many (see above, III-1). This message has usually been spread through e-mailing lists made of personal or institutional contacts. Interestingly, many expats confess that prior to such a call, they had been away from any national initiative. The fact that it is based on professional and intellectual reasons and interests seems to have fueled the mobilisation process while political or patriotic channels appear to be more divisive or dissuasive. The new media, internet, being neutral on these aspects and in this particular context, has allowed reconnection on new grounds.

c) Enrolment

The DKN identified (part II and appendix 2) reveal a high degree of formal enrolment into associative structures. The expatriates agree to become members of a collective endeavour with an explicit purpose for which they play a definite role. The review of websites shows that a number of associations exhibit their affiliates personal data and professional features. They are stored in data bases as individual components of the network, to which they agreed to serve the purpose, becoming by the same token accessible to anonymous actors that would reach the network for any reason or objective. The actors are thus "punctualised" in the network, as described by Callon et al. (1986b, 1991)

The evidence clearly shows that adequate problematisation, significant mobilisation and actual enrolment have been achieved by the diaspora option in general and individual DKN in particular. However, there is one point on which the results have been most of the time much less satisfactory: interestment. And on interestment depends sustainability...

Interessment is what durably ties the actor to the network. Beyond simple incentives susceptible of generating psychological motivation, it covers all the intermediaries that stick the actor to a particular network. *Inter-esse*, in latin means to stand in between. The interessment devices (*dispositifs d'intéressement*) are those standing between the actors and nurturing collective action through which they link up. It takes for granted that the actor's situation is in a competitive environment: interessment is what makes him/her select one network instead of others, among various possible connections.

In DKN, like in innovation networks in general, the interessment devices may be diverse: programmes, funding, invitations, meetings, rewards, contracts, information, etc. In a physically scattered group of actors, ICTs play an immense role among these devices. They have the power of extracting the individual expatriate of its daily local networks to insert him/her within those of relevance in the origin country. However, this only makes sense for active purposes since the involvement in a DKN is not for communication *per se* but for action with regards to developments at home. This explains the weariness towards passive general mailing lists expressed by R-Caldas members for instance and the importance of interactive *ad hoc* devices such as those presented in the following chapters of this report. ICTs have the power to attract expatriates on actions in origin country's networks. But without action this attractive power vanishes into the air. This tends to plead for focused instruments, ones that would get along proper institutional or organisational forms on specific projects run jointly by DKN and home communities members.

However, there is a very specific feature of DKN in interessment procedures and one that may explain some of their shortcomings in that regard. At the opposite of conventional innovation networks as presented in the theoretical approach above, indeed, DKN do not aim at definitely and exclusively capturing the actor-networks represented by the expatriates. They, instead, try to only temporarily do so in such a way that these actors keep his/her multiple connections. Taking apart the expatriate from his/her invaluable networks is the last thing that DKN would pursue, at the difference of traditional innovation processes. A DKN member is, by definition, the bridge between his/her own networks in the host country and the ones of the origin country. This collaborative (vs competitive, in the traditional innovation networks) scheme is theoretically possible and actually successful in a number of cases but the tension does exist. It may result in a withdrawal if the interessment procedure is not strong enough, as proved by a number of cases.

As mentioned above, the expatriate is generally very well inserted in his/her socio-professionnal and other networks in the host country. These generate strong interessment devices locally which tend to hold the actor far from any non-competitive association pro-

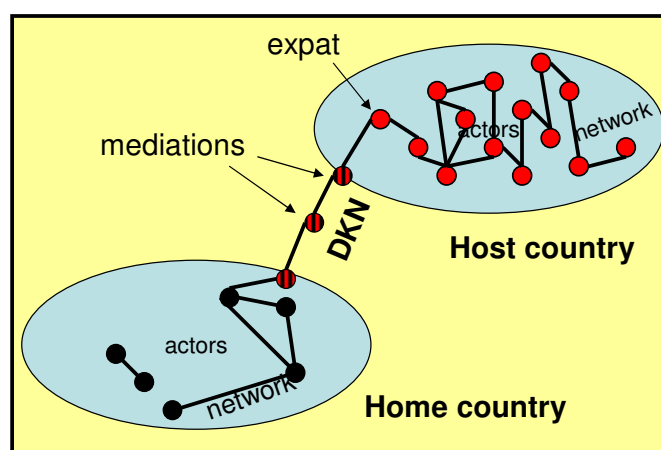
posed from a peripheral place. For instance, why would a prominent geneticist leading international projects from the UK be interested in linking with peers in his native Bangladesh if no demand is relayed, no concrete perspective given, no support considered, no information provided? In spite of his awareness of this country's problems (problematization), personal motivation (mobilization) and initial involvement in tentative actions (enrollment) when called by his fellows at home, he may slowly or quickly drop out and even try to get protected from further useless disturbances in his daily work, when checking that his engagement is not met by investments on the other side.

In fact, many testimonies of DKN members point to the fact that passivity – a generic term for absence of (re)activity- in the country of origin led them to stand aside, sometimes with the feeling of having been first lured then deceived. A basic reason is time, as time translates the individual's investment in networks, therefore the interest exerted by these on the actor. Even though the diaspora option is non exclusive since it combines existing and new associations, time is a non compressible variable which implies selection. Then, sometimes, the expatriate has to choose between the alternatives of time to be devoted to - in that particular sense competing- activities. At the opposite of the return option, in which competition with alternative activities from other associations are canceled or minimized by the expatriate's physical reintegration, the diaspora option always has to provide attractive conditions for/by action since mobilization is always partial. Moreover, in some reported instances, the expatriate's investment into a DKN conflicted with his/her professional involvement, when expectations of associations of his/her networks in the host country have been unmet by corresponding ones in the origin country.

This clearly draws the line of conduct for DKN. They must aim at minimizing the conflict of interest and be equipped accordingly. If the executives in the diaspora have very little time - though a highly productive one because of their networks- then the DKN must provide time-producing (vs time-consuming) intermediaries, in other words it must focus on productivity. Technology is a key issue here but policy is not less important. The combination of both is necessary. Rapid access to the actors is only possible if information technology is available but also if these actors have been previously made aware of the option, mobilized, enrolled and interested. This means a massive involvement of heterogeneous actors, especially in the country of origin, to multiply mediations and possible interactions with the diaspora (see further, figure 3 and examples of China and India).

In many home countries this effort has not been made. The creation of institutions has recently been proposed as a possible answer and counterpart of the diaspora in the origin country (see Kuznetsov et al. 2006 and Chaparro et al. 2004). However, it is only a part of the answer. It unrealistically assumes that the diaspora groups will provide their skills and contacts to a governmental agency making interface with the local communities, as if both the former and the latter were homogeneous entities easily represented by a couple of single actors. In the case of the Colombian Caldas network, disengagement and criticisms from the expatriate members coincided with its institutionalisation within Colciencias during the mid and late 1990s. Instead of strengthening the response to the diaspora supply it weakened its diffusion and ramification in the social fabric in Colombia.

Figure 3: Necessary mediations between actors within Diaspora Knowledge Networks



The institutionalist, structuro-functionalist approach (Merton 1973) in the sociology of science shows its limit when it turns to science policy at the meso level where networks operate. A macro actor like the home country State must certainly show the way and boost initiatives but should delegate and pass on decisions, measures and negotiations to other characters. The Chinese and Indian cases leave no place for doubt on this point. Erroneously perceived as paramount of centralised intervention, these countries exhibit a tremendous involvement of heterogeneous actors, a multiple mediation process, in the development of their S&T diasporas (Xiang Biao 2006, Leclerc and Meyer 2007). Central state has had a clearly favorable policy indeed – *wei guo fuwu* in China, high level committee on diasporas in India- but the initiatives of provincial states, distinct administrative bodies, single institutions, para-statal organisations, ONGs, academias, firms, individuals, and so on, have had a decisive impact.

The fact, that many different DKN and programmes developed at the same time for the same country of origin did not have a negative effect. At the opposite, it helped multiply the opportunities of cross fertilisation. Therefore, instead of -or beyond- institution building, the State's role is rather to suggest, facilitate and coordinate multiple actors initiatives. This is where governance actually takes place and it would not have become possible without distributed knowledge schemes opened by ICTs.

III – Thinking of policy approaches

The present section aims to synthesise the elements of the DKNs social dynamics that have been pointed at in the previous paragraphs and to articulate them with organisational and technological devices that can support the dynamics and their sustainability. The solutions come from a good combination of both, with no deterministic approach and rather an emphasis on policy relevant decisions. This approach is thus referred to as “technopolicy”, as technological and public -as well as institutional- policy issues and options are completely intertwined. In no ways does this presentation pretend to close the reflection and discussion on the subject matter. But it suggests some perspectives and practices to be explored, experimented, tested and evaluated.

The art of mediation and the need for action

Comparing the 2 pictures of success stories and failures, a striking difference may immediately be noticed. While the first show large numbers of actors of all sorts involved in the relationship between home and host countries and besides these, the second exhibit a scarce population of a few individuals and organisations with little interaction. The Indian and Chinese cases even reveal that there is no exclusive way of populating these networks: the former relies on market, business and essentially private links and the latter on institutional, academic and mainly public ones. What matters is not status or category but rather plurality and involvement. No fear should thus be kept about possible redundancies and on a supposed obligation of links optimisation in order to be efficient, like some social network and capital approaches or interpretations would tend to indicate (Burt 2000).

In fact, the representative model to follow has more to do with the lessons from the recent field of innovation studies (sociology, anthropology and economic geography). The evidence

shows that highly innovative *milieux* are made of heterogeneous networks interweaving increasingly in a reduced space where productive associations tend to concentrate. The intensity of exchange is thus correlative to dense though exclusive links where tacit knowledge can flow easily and quickly. Though the literature has focused on the local nature of such spillovers and transfers, it is also shown that actually, the geographical proximity is not the important factor. It is only a reflection of social relationships made possible by neighbourhood as it appears when physical and relational factors are analytically distinguished (Breschi S., Lissoni F. 2003).

What is precisely at stake in the DKNs is the recreation/recomposition of such neighbourhood conditions in spite of the *dis-location* of actors. To reproduce the relational intensity and interactive proximity of highly innovative *milieux*, information and communication technologies are absolutely crucial. So far, the experience shows that these have been critical for almost all the identified networks, in initial messages to build participation, recruit members and disseminate basic information but their potential for interaction has been severely neglected. When compared to the use of interactive technologies in multinational firms, DKNs appear very limited and at embryonic stage. For instance, in MNCs, the frequent parallel use of audio-conference through telephone lines for unformal exchanges, along with intranet high speed data transfers, completed by satellite occasional visio-conferences have been intensively used for the past 2 decades. This explains their tremendous growth and their increasing transfer of R&D and knowledge producing capacities and core activities, in non-original, decentralised places. The DKNs should observe the corporate world tactics and techniques in this regard and translate some of these modalities into their own needs and practices.

The virtues of DKNs are often described as their ability to transmit or channel information in a very effective manner, accelerating transactions, making them more reliable and smoother. Bridging capacity, gate keeper's role and reputation enhancer are the main qualities generally attributed to these networks. In such a perspective, the diaspora facilitates, rather in a passive way, the transmission of resources whose generation and utilisation are determined elsewhere, in both the host and home countries. These qualities, though real, do not make justice to the actual participation of the diaspora in the constitution and appropriate allocation of resources. The actor-network theory provides, here again, a more accurate conceptualisation. The diaspora plays, indeed, a role as mediator and not only intermediary. For Latour (Latour, 2005) an intermediary just transmit something without transformation, but a mediator modifies it and adds a specific value, which is the case in the successful asian examples mentioned in the former section (Leclerc and Meyer 2007).

As Kapur and Mac Hale (2005) rightly point out, what would the diaspora advantage consist in if it was only an additional information provider²? Today, the supply of information is not a problem any more; what is important is to get the right and appropriate information for specific purposes. The diaspora thus acts as a selector of information in relation to certain needs and activities. There is no doubt that the data mining and mapping techniques described in the following chapters of this volume are of high interest in this regard, for a better intervention of diasporic actors.

However, the mediation role of the diasporic actors goes much beyond this information selector's effect. In fact, DKNs are not simply go-between facilitating contacts and cooperation between home and host countries entities. They are not passive agents expecting initiatives to be relayed through their associations and communication facilities, apart from some dormant networks whose members sporadic mobilisation may sometimes keep individually connected though collective dynamics have slowly faded. The very existence of DKN is tied to action. It is what fuels the networks. What distinguishes DKNs from cooperation agencies and from any traditional international scientific or business network, is the collective identification and commitment towards national knowledge goals. What justifies the voluntary involvement of their members in favour of their countries of origin, is the purpose of contributing by their skills to these countries development. This contribution is concretely realised through projects. If the networks are not fed by projects, if action does not nurture their life, they gradually congeal and lose their members, as several examples show. This has a direct incidence on both technology and management.

Technology must be geared towards serving these actions and concrete projects. In fact, the term "ICTs" - *Information and Communication Technologies* – does not seem the most appropriate in that it alludes to intangible, abstract phenomena while interactive devices would be those most fitted to the networks purposes. However, the former (static websites, email diffusion lists, etc.) have prevailed so far over the latter in DKNs (Turner et al. 2003). Such distributed knowledge practices allowing dis-located production and use of skills are described in this volume and give a new field of expansion for DKNs as *entrepreneurial* (obviously not necessarily lucrative) hubs.

² Chap 7 on the role of the diaspora : "The problem facing economic agents today arises not from a lack of information but from a deluge of it, as people are bombarded with more information than they are equipped to handle. In order to control the flood of knowledge, they have come to rely heavily on social networks...", (Kapur & Mac Hale, 2005, 112)

Management should strategically be oriented towards projects. The diaspora is not a stock of human resources that comes in addition to intellectual/professional communities at home. It is an extension of these and should be associated to programmes of collective interest. This is where the interestment devices must take place. To decide upon these, technologies are necessary: they may, for instance, provide the virtual room where the convergence of actors goals may be built.

Necessary investments for a win win solution

The role of the State in interestment devices is crucial not only by its own input but also by the example it sets for other actors, public or private. Recent surveys of DKNs unanimously converge on the importance of nation states involvement (IRD, Barré et al 2003; WBI Kuznetsov et al. 2006; ADB 2006). Governmental agencies may systematically provide infrastructural elements (databases, portals, websites, information in general) easing the access of the expat's networks to local (origin countries) ones like in the case of Colombia today (see Castro Sardi, 2007). It may also grant action-tied resources, be they material (fundings, equipments, technical support), organisational (institutional support, procedural guidance, administrative assessment) or symbolic (rewards, mediatisation, exposure). Above all, it may act as intermediary among multiple actors (for instance chamber of commerce, scientific councils, universities, multi or national companies, etc.) both abroad and at home through its various services at different levels. Then the network logics takes on without the initial actor being contiguous to newcomers, in an expansion dynamic of increasing returns. To fuel interestment devices, self-sustained action oriented processes, strategic investments are crucial along with interactive technologies. Whatever enthusiastic it is to cooperate with the country of origin, the diaspora will not durably do so without continuous relationnal facilitation. Passive usage of technologies, simply relying on supposedly inherent properties of communication hold by the artefacts will be of no use. Human agency in ICTs support of DKN is crucial (Turner et al. 2003) and it may be part of governmental or cooperative bodies role to ensure its presence, at various places along the chains of actors associations. Such an investment must not be neglected: the same happens in any cluster, incubator or technopole. Mediators assume collective learning tasks, circulation of tacit knowledge, representation under various forms, risk sharing on uncertain projects. Without their participation – a public good indeed – little externalities, accumulation and transfers would be generated.

It would seem natural that origin countries, as obvious possible beneficiaries, make such kinds of investments. However, it is also the role of host countries as well as intergovernmen-

tal organisations to grow and feed these chains of intermediation because they potentially benefit to both poles of migration systems (co-development perspective) and to a multilateral cooperative regime (global redistributive prosperity perspective). Technopolicy options have been identified that would make these investments on both the host and home countries possible. Diaspora incubators in OECD receiving countries have been conceived as connective platforms with both equipments (hard and soft) and strategic data (access to social, economic and other resources) to expand the DKN capacities and to professionalise them (Barré et al 2003). Local antennas in origin countries have been suggested as the interface between external actors and national programmes (Lema 2003). There too, is the idea of both infrastructure giving access to potential partners, organisationnal entities providing virtual spaces where repretative actors could meet and decide upon projects of common interest in and outside the country and programmes for which investments would be made to boost joint activities between home communities and expatriate members .

In a world where the hypothesis of the diaspora model generalisation (Bordes-Benayoun, Schnapper 2006), the blurring of borders in migratory schemes (Pécoud, Guchteneire 2005) and the mobility/sedentary patterns transformation through ICTs (Diminescu 2005), take every day more consistency, nation-states projection into the future does require a proactive technopolicy. Forging the instruments of an emerging cosmopolitanism (Beck 2006) has indeed become a crucial issue. This is what is at stake here.

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