



# THE LEAST DEVELOPED COUNTRIES REPORT 2012

*Harnessing Remittances and Diaspora Knowledge to Build Productive Capacities*

## CHAPTER 4

### MOBILIZING THE DIASPORA: FROM BRAIN DRAIN TO BRAIN GAIN



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**MOBILIZING THE DIASPORA:  
FROM BRAIN DRAIN TO BRAIN GAIN**



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## A. Introduction

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The present chapter analyses two aspects of international migration in the LDCs not yet discussed in this Report. First, it studies the flows of knowledge and technology stemming from the international movement of labour — particularly from the migration of so-called high-skilled persons — , their impact on the human capital endowment and technological accumulation of LDCs, and the emergence of diaspora knowledge networks. Second, the chapter examines the impact of international migration on the business activities of these countries through two mechanisms: international trade and investment flows between home and host countries; and returnee entrepreneurship.

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*Brain drain is more prevalent in LDCs than in other developing countries.*

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The issues of brain drain, brain gain, brain circulation and the effects of diaspora networks on home countries are very contentious. They involve complex processes produced by economic, political and social factors and strongly influenced by policies in both sending and receiving countries. Mainstream academic and policy discussions have swung from a pessimistic view to a rather optimistic position on these processes. A significant share of the literature is theoretical, but lacks empirical validation. Another portion of research focuses on national or local case studies, the conclusions of which cannot always be generalized. There is scarcely any study of these processes for the group of LDCs, which is what this chapter strives to do.<sup>1</sup> It shows that brain drain is more prevalent in LDCs than in other developing countries and is especially strong in islands and some African LDCs. However, the potential contribution to the home country stemming from the strong presence abroad of high-skilled LDC nationals and other members of the diaspora is not automatically realized. This is especially true of knowledge transfer and sharing, the strengthening of trade and investment linkages, or the contribution of returnees to their home country. Achieving this potential depends on a series of institutional, economic and political conditions, which are so far missing in most LDCs. Therefore, policy action by home and host countries, as well as by the international community, is crucial in order to foster or strengthen positive diaspora effects on LDCs.

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The chapter is organized as follows. Section AB explains how home country economies can be adversely affected by brain drain and analyses its trends globally and in the LDCs. Incorporating more recent research on the issue, Section C analyses how the international movement of skilled persons has the potential to benefit the countries of origin, and examines to what extent LDCs are availing themselves of these opportunities. Section D summarizes and concludes.

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## B. Brain drain and its adverse implications for home countries

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### 1. ANALYTICAL FRAMEWORK

*Labour movements and knowledge flows.* All international movement of labour entails some degree of knowledge flow across countries, which takes place in two basic forms. First, embodied knowledge directly accompanies people whenever they move across borders temporarily or permanently, “carrying with them” the knowledge which has been accumulated through education, learning and/or experience. Second, once migrants are settled abroad they can share their knowledge, skills and technology with their home country at a

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distance (e.g. through information and communication technologies (ICTs)), i.e. without this involving the cross-border movement of natural persons.

International migrants consist of people with all levels of educational background, including those with no formal education and those with some degree of primary, secondary or tertiary education. Differences in knowledge and skills between non-migrants and migrants and among the latter tend to become more accentuated as the migratory experience unfolds. Time spent studying, living and working abroad usually allows migrants to be exposed to different cultural and business environments and to acquire new skills, such as language, craft, technological, academic, professional, managerial, networking and relational capabilities. This human capital accumulation abroad takes place through different mechanisms, including formal education, informal channels (e.g. on-the-job training, learning by doing while working) and/or accumulated experience (Dustmann et al., 2011; Domingues dos Santos and Postel-Vinay, 2003). All emigrants can acquire some type of new skills and knowledge, but this tends to happen more intensively the more skilled emigrants are, through a process of cumulative causation driven by the increasing returns that are typical of knowledge and its accumulation.

While all international migrants have some knowledge and skills, a large portion of the research and policy discussions on brain drain and brain circulation focuses on so-called “high-skilled migrants”. These are migrants who have some length of tertiary (i.e. university-level) education, ranging from one year of study at this level to post-doctorate graduates.<sup>2</sup> Statistics generally use this definition of high-skilled worker. Accordingly, brain drain has been defined as “the migration of engineers, physicians, scientists, and other very highly skilled professionals with university training” (Docquier and Rapoport, 2008).

Two other categories largely overlap with that of high-skilled workers: knowledge workers and talent. Knowledge workers are those persons who possess specialized knowledge and are involved in high value-added and high-productivity jobs that are essential for the global knowledge economy and society. The category of internationally mobile talent is composed of three broad types: 1. directly productive talent (entrepreneurs, executives, managers, and technical engineers); 2. scientific talent (academics, scientists and international students); and 3. health and cultural talent (physicians, nurses, artists, musicians, writers, and media-related people) (Solimano, 2008).

*The knowledge-based economy and brain drain.* International movements of skilled people or talent are a feature of the knowledge-based economy (David and Foray, 2002; Foray, 2006; Hollanders et al., 1999). The latter also has the following defining features:

- It produces increasingly knowledge-intensive goods and services, which in turn require skilled labour inputs for their production. This raises demand for skills (or talent) both in terms of the number of workers and in terms of the skill level of each worker;
- The intangible capital stock (resulting from investment in education, training, research and development, health, etc.) tends to become larger than physical capital (physical infrastructure and equipment, natural resources, etc.);
- Knowledge is increasingly becoming the crucial determinant of countries’ long-term growth and international competitiveness.

Given these developments, knowledge is part of UNCTAD’s definition of productive capacities and plays an essential role in the development of LDCs (UNCTAD, 2006: 59–84, 2007: 1–10).

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*The agglomeration economies of knowledge-intensive activities lead to the concentration of high-skilled people in a few countries.*

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The agglomeration economies typical of knowledge-intensive activities lead to the concentration of high-skilled people in a few locations (nationally) or countries (internationally). Talented individuals rarely develop their full potential by working in isolation. A new idea, a new product, a new production process or a new scientific theory requires human interaction and cooperation. An entrepreneur needs access to capital, markets and technology to develop his or her new ideas and visions. A scientist needs a certain number of peers to discuss his or her theories and present research papers. As a result, highly skilled people from both developed and developing countries — including LDCs — who decide to emigrate mainly choose developed countries as their migration destination (see subsection B2a below).

Recent research<sup>3</sup> on high-skilled labour identifies the following main factors that drive its international mobility:

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*The main factors driving international mobility of high-skilled labour are:*  
*(a) More favourable conditions for professional development in host countries; (b) Adverse conditions in home countries; (c) Lower relative migration costs for the high-skilled; (d) Selective immigration policies for attracting foreign talent.*

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- More favourable conditions for professional development in host countries. In destination countries, high-skilled emigrants typically earn higher salaries than in their home countries. The pay gap is such that salaries in developed destination countries are sometimes 20 times higher than in LDC countries of origin. Host countries allow higher labour productivity, thanks to a better institutional environment and to the externalities stemming from the agglomeration of knowledge workers. Complementarities between talent, capital and technology reinforce these agglomeration economies. Moreover, destination countries offer better opportunities for professional development in terms of career advancement prospects as well as better living conditions for emigrants and their families, superior infrastructure necessary for work and daily life, and political stability. In most cases, host countries offer more favourable conditions for research and academic interaction for scientists, as well as more secure property rights for entrepreneurs;
- Adverse conditions in home countries (e.g. political strife, civil conflict, insecurity), which act as push factors of international migration;
- Lower relative migration costs for the high-skilled as compared to the low-skilled, given the former's easier access to information on host country labour markets, more favourable migration conditions and their greater access to transportation;
- Selective immigration policies for attracting foreign talent enacted especially by several developed countries.

## 2. BRAIN DRAIN TRENDS

The following section briefly analyses global trends and future prospects for international flows of high-skilled labour, in order to put trends concerning brain drain and knowledge circulation in LDCs into perspective.

### *a) Global trends*

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*Brain drain has been increasing worldwide in absolute figures.*

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**Current flows of high-skilled workers.** Brain drain has been increasing worldwide in absolute figures. The number of high-skilled international migrants climbed from 16.4 million in 1990 to 26.2 million in 2000, which implies an annual growth rate of 4.8 per cent. Between 2000 and 2010, the emigration of highly educated persons continued to increase, rising at an estimated annual pace of 4 per cent (based on figures for the United States, the largest destination for brain drain worldwide and home to some 40 per cent of all high-skilled emigrants). Complete data on worldwide bilateral flows of high-skilled labour are available for 1990 and 2000, because at the time of writing this Report, most results of the 2010 round of population censuses (the major primary source for brain drain statistics) had not yet been published.<sup>4</sup> The UNCTAD secretariat has collected

more updated indicators and information on high-skilled emigration from LDCs and has also commissioned case studies on some of these countries. Together, these sources of information and data provide solid evidence for analysing major flows, trends and structural features of brain drain.

International immigration is selective, since it is skewed towards highly educated people. Twenty-six per cent of all international migrants are tertiary-educated (according to data for 2000), while only 11.3 per cent of the world labour force have tertiary education. In developing countries, university-level workers account for a much lower five per cent of the labour force.

The selectivity of international migration is also reflected by the different emigration rates, i.e. the number of emigrants as a share of the corresponding labour force segment. Worldwide, the emigration rate is 6.6 per cent for all tertiary-educated people, well above the 2.63 per cent emigration rate of low-skilled people. Moreover, the degree of skill-based selectivity of immigration varies sharply according to the development level of the host country, rising with the development level of the destination country of international migrants. In developed countries, 35 per cent of immigrants are tertiary-educated, while in other developing countries (i.e. those developing countries which are not LDCs) this share is one-third of that level: 13 per cent. In LDCs, by contrast, a mere four per cent of immigrants are highly skilled (chart 33). Immigration selectivity has been increasing. Worldwide, the total stock of high-skilled immigrants rose by 60 per cent between 1990 and 2000, while that of low-skilled migrants went up by a modest 16 per cent. This is largely driven by immigration trends in developed countries. There, the selection rate (i.e. the tertiary-educated as a share of all immigrants) rose by six percentage points in the ten years to 2000. This confirms the tendency of human capital to agglomerate in locations where it is already relatively abundant (Docquier, Marfouk et al. 2011), a tendency which is reinforced by selective immigration policies in major destination countries.

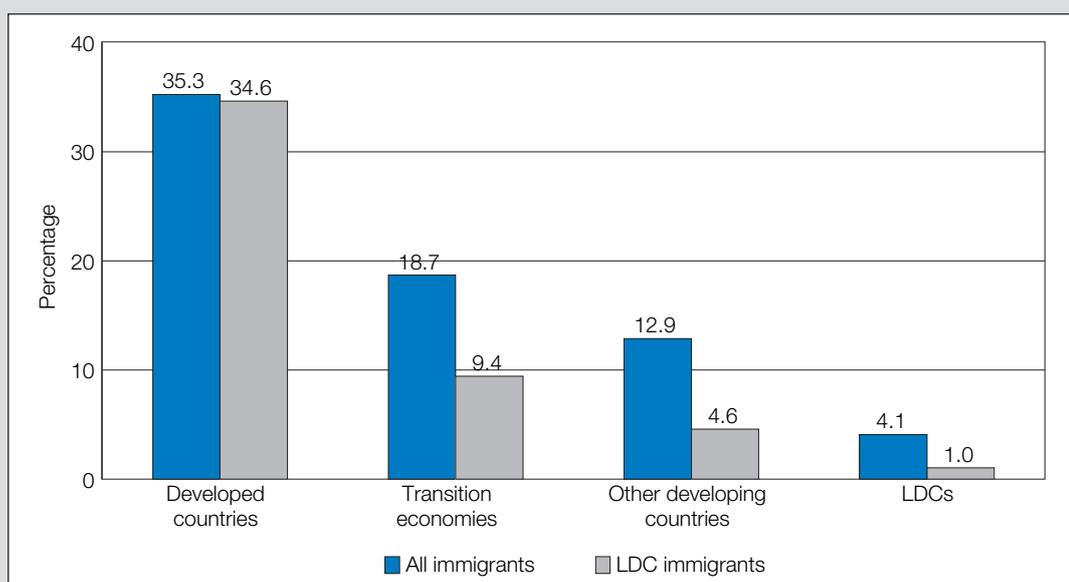
More than half of international high-skilled migration is South–North. The second most important flow of tertiary-educated people is North–North: migration among developed countries amounts to almost one-third of

*International immigration is selective, since it is skewed towards highly educated people.*

*The degree of skill-based selectivity of immigration rises with the development level of the destination country.*

*More than half of international high-skilled migration is South–North.*

**Chart 33. Immigrant selection rate of major host country groups, 2000**  
(Share of worldwide and LDC immigrants with tertiary education)



Source: UNCTAD secretariat calculations, based on data from Docquier et al. (2011).

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*Skilled migration flows are highly concentrated in a few destination countries, and developed countries absorb some 80 per cent of these flows.*

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international skilled labour flows. Skilled migration flows are highly concentrated in a few destination countries, and developed countries absorb some 80 per cent of all international high-skilled migratory flows. The major country is the United States, which hosts some 40 per cent of all internationally mobile high-skilled people. It is followed by Canada, Australia, United Kingdom, Germany, Russian Federation and France.<sup>5</sup> The professions most affected by brain drain are computer specialists, accountants, managers, medical doctors and nurses and, among higher education levels, scientists and academics.

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*The international mobility of high-skilled persons is likely to continue in the future.*

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The gender balance of brain drain seems to be closely associated with the level of development of destination countries. In developed countries, high-skilled men and women each account for half of total high-skilled immigration. In the group of other developing countries, two-thirds of all tertiary-educated immigrants are male, while in LDCs this share is 71 per cent. In developing countries of origin, genders differ slightly in their brain drain rates (i.e. the number of tertiary-educated emigrants as a share of the labour force at the same level of education in the home country). They are five per cent for males and six per cent for females. The main reason for this discrepancy is that tertiary education enrolment in home countries is higher for males than for females (Docquier and Rapoport, 2012).

**Future outlook.** Based on underlying forces pushing current international migratory flows, and barring major disruptions in the international economy, the international mobility of high-skilled persons is likely to continue in the future, largely as a result of the following trends:

- The growing knowledge intensity of the world economy (see section B1);
- The decline in demographic growth and consequent ageing of the world population, as well as the expanding demand for health services which accompanies development;
- The steadily falling costs of transportation and communication;
- Economic interdependence brought about by globalization;
- The lingering income gaps between professionals in developed and in developing countries.

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*An estimated 1.3 million workers with university-level education had emigrated from LDCs by 2000.*

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The first two processes above are progressing at a faster pace in developed countries than in developing countries. Together with the other three, they are likely to continue driving international movement of skilled labour in the future.<sup>6</sup>

### *b) LDC trends*

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*During the 2000s, the number of high-skilled persons migrating from LDCs to the main destination countries continued to grow.*

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An estimated 1.3 million workers with university-level education had emigrated from LDCs by 2000. While this was 58 per cent more than a decade earlier, bilateral flows developed unevenly. The greatest increase was in emigration to developed countries, which almost doubled during this period (table 13). By now the total stock is estimated to have exceeded two million.

During the 2000s, the number of high-skilled persons migrating from LDCs to the main destination countries continued to grow. In the United States, the number of tertiary-educated residents born in LDCs rose by 78.7 per cent between 2000 and 2010. Table 14 provides the corresponding data, as well as indirect evidence of developments in brain drain from LDCs to major destination countries.<sup>7</sup> These data indicate continuing growth in migration of high-skilled LDC nationals to other developed countries. Such a result is somewhat surprising, since it comes in spite of two major developments that are likely to have depressed immigration in those countries in the 2000s: first, the immigration backlash following the 9/11 attacks; and, second, the world economic and financial crises which started in 2007. These developments seem

**Table 13. International high-skilled migration corridors from LDCs, 2000**

(Number of high-skilled migrants and percentage)

Country of origin	Country of destination									
	Developed			Transition economies	Other developing			LDCs		Total
	Asia Pacific	Europe	North America		Africa	America	Asia	Africa	Asia	
<i>Number of migrants</i>										
LDC Africa	14,245	170,814	178,561	55	86,763	380	44,696	29,809	-	525,323
LDC Americas	20	2,127	150,999	0	19	8,138	11	-	-	161,314
LDC Asia	37,179	67,041	192,243	218	2,297	17	295,669	-	2,703	597,367
LDC Pacific	10,450	354	5,762	1	4	1	6	-	-	16,578
LDC Total	61,894	240,336	527,565	274	89,083	8,536	340,382	29,809	2,703	1,300,582
<i>Percentage of destination</i>										
LDC Africa	23.0	71.1	33.8	20.1	97.4	4.5	13.1	100	-	40.4
LDC Americas	-	0.9	28.6	-	-	95.3	-	-	-	12.4
LDC Asia	60.1	27.9	36.4	79.6	2.6	0.2	86.9	-	100	45.9
LDC Pacific	16.9	0.1	1.1	0.4	-	-	-	-	-	1.3
LDC Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100	100	100.0
<i>Percentage of origin</i>										
LDC Africa	2.7	32.5	34.0	-	16.5	0.1	8.5	5.7	-	100.0
LDC Americas	-	1.3	93.6	-	-	5.0	-	-	-	100.0
LDC Asia	6.2	11.2	32.2	-	0.4	-	49.5	-	0.5	100.0
LDC Pacific	63.0	2.1	34.8	-	-	-	-	-	0.0	100.0
LDC Total	4.8	18.5	40.6	-	6.8	0.7	26.2	2.3	0.2	100.0

Source: UNCTAD secretariat calculations based on data from Docquier et al. (2011).

**Table 14. Indicators of high-skilled immigration from LDCs to selected host countries in the 2000s**

(Persons and percentage)

Host country	Indicator	Initial period (A)	Latest period (B)	Persons		Change (B/A : %)
				(A)	(B)	
United States <sup>a,b</sup>	Number of tertiary-educated residents from 15 LDCs (amounting to 91 per cent of total LDC high-skilled residents in 2000)	2000	2010	381,425	681,485	78.7
	Number of non-resident visas for skilled persons granted to nationals from all LDCs	1998-2000	2008-2010	1,289	1,364	5.9
Canada <sup>c</sup>	Permanent residents born in all LDCs	1999-2001	2009-2011	15,950	22,813	43.0
	Arrival of students born in all LDCs	1999-2001	2009-2011	1,514	2,406	58.9
United Kingdom <sup>d</sup>	Nationals from all LDCs given work permit for jobs other than domestic work	2004	2009	676	1,581	133.9
	Nationals from all LDCs granted entry into the UK under PBS Tier 1 (Highly skilled workers) and PBS Tier 2 (Skilled workers) schemes	2009	2010	788	1,077	36.7
France <sup>e</sup>	Number of workers' visas granted to nationals from all LDCs	2004-2005	2007-2008	324	1,214	274.7
	Number of student visas granted to nationals from all LDCs	2004-2005	2007-2008	4,841	4,446	-8.2
Australia <sup>f</sup>	Number of high-skilled nationals from all LDCs arriving for permanent settlement	2000-2001	2010-2011	964	1,121	16.3

Source: UNCTAD secretariat elaboration based on the sources quoted in the notes (see below).

Notes: When periods are indicated, data refer to annual averages. The destination countries above hosted 55 per cent of high-skilled emigration from LDCs in 2000.

a US Census 2010 (for 2010); American Community Survey 2010 (for 2010) for the number of tertiary-educated residents from 15 LDCs.

b State Department, for the number of non-resident visas for skilled persons. Includes the following visa types: H1-B, H1-C, L1, O1 and E-2.

c Statistics Canada.

d Home Office and National Statistics. PBS: Points Based System for immigration, introduced in 2008.

e Institut national d'études démographiques.

f Department of Immigration and Citizenship.

to have been offset by the continuing operation of the push and pull forces driving brain drain mentioned in section B1.

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*Skilled migratory flows from LDCs are directed mainly to developed America and Europe, oil-exporting developing countries and neighbouring countries.*

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**Host countries.** Almost two-thirds of LDC high-skilled emigrants live in developed countries, while one-third moved to other developing countries. Skilled migratory flows from LDCs are directed mainly to developed America and Europe, oil-exporting developing countries and neighbouring countries (chart 34). The major destination country of the LDC brain drain is the United States, which hosts one-fourth of all LDC high-skilled emigrants. Other major destination countries are Saudi Arabia, Canada, the United Kingdom, India and France (chart 35). North America hosts almost the entirety of the Haitian brain drain and approximately one-third of high-skilled emigration from the LDCs of Africa, Asia and the Pacific (table 13). The remaining flows from each of these regions differ geographically. For African LDCs, the other major destination is developed Europe (especially the United Kingdom, France and Belgium) and, to a lesser extent, other developing African countries (mainly Côte d'Ivoire, South Africa and Kenya). Asian LDCs are the group for which intraregional South-South flows are the most pronounced: almost half of their high-skilled emigrants live in other Asian developing countries (especially India, Saudi Arabia, Thailand, Iran and the Gulf States). For Pacific LDCs, New Zealand and Australia host almost two-thirds of their high-skilled emigrants.

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*The selection rate of immigration from LDCs is directly related to the income level of destination countries.*

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The selection rate of immigration from LDCs is directly related to the income level of destination countries, as is the case for immigrants from all other countries. In developed countries, the selection rate is highest: 35 per cent of all immigrants born in LDCs are tertiary-educated. In other developing countries, the corresponding share is much lower (five per cent), while in the case of other LDCs it is a scant one per cent. In other words, intra-LDC migration largely consists of low-skilled persons. The total selection rate of LDC immigrants in developed countries is similar to that of immigrants coming from other regions. In developing countries, by contrast, immigration from LDCs is much less selective than migratory flows originating in other country groups (chart 33). This confirms the strong Northern bias of LDC skilled emigration. Available data indicate that LDC emigration selectivity rose in the 2000s. In the United States (the largest host country for LDC high-skilled emigrants), the selection rate for LDC nationals rose from 32.4 per cent in 2000 to 48.3 per cent in 2010 (based on the same sample as table 14).

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*The major source of high-skilled LDC emigrants is Asia (45.9 per cent of the LDC brain drain) followed by African LDCs (40.4 per cent).*

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**Home countries.** The major source of high-skilled LDC emigrants is Asia, which generates 45.9 per cent of tertiary educated migrants from LDCs. It is followed by African LDCs, which account for 40.4 per cent of the LDC brain drain (table 13). Regional figures, however, mask a very strong concentration of migratory flows in a few countries. The largest LDCs of origin for skilled migrants are Bangladesh and Haiti, both of which have more than 160,000 high-skilled nationals living abroad. These two countries account for 30 per cent of all LDC migration. They are followed by Afghanistan, Yemen, Sudan, Lao People's Democratic Republic, Ethiopia and Cambodia, each of which have more than 50,000 high-skilled people living abroad (chart 36). Taken together, these nine countries account for almost two-thirds of LDC brain drain. Data on the major bilateral high-skilled migration corridors originating in LDCs are shown in table 15.

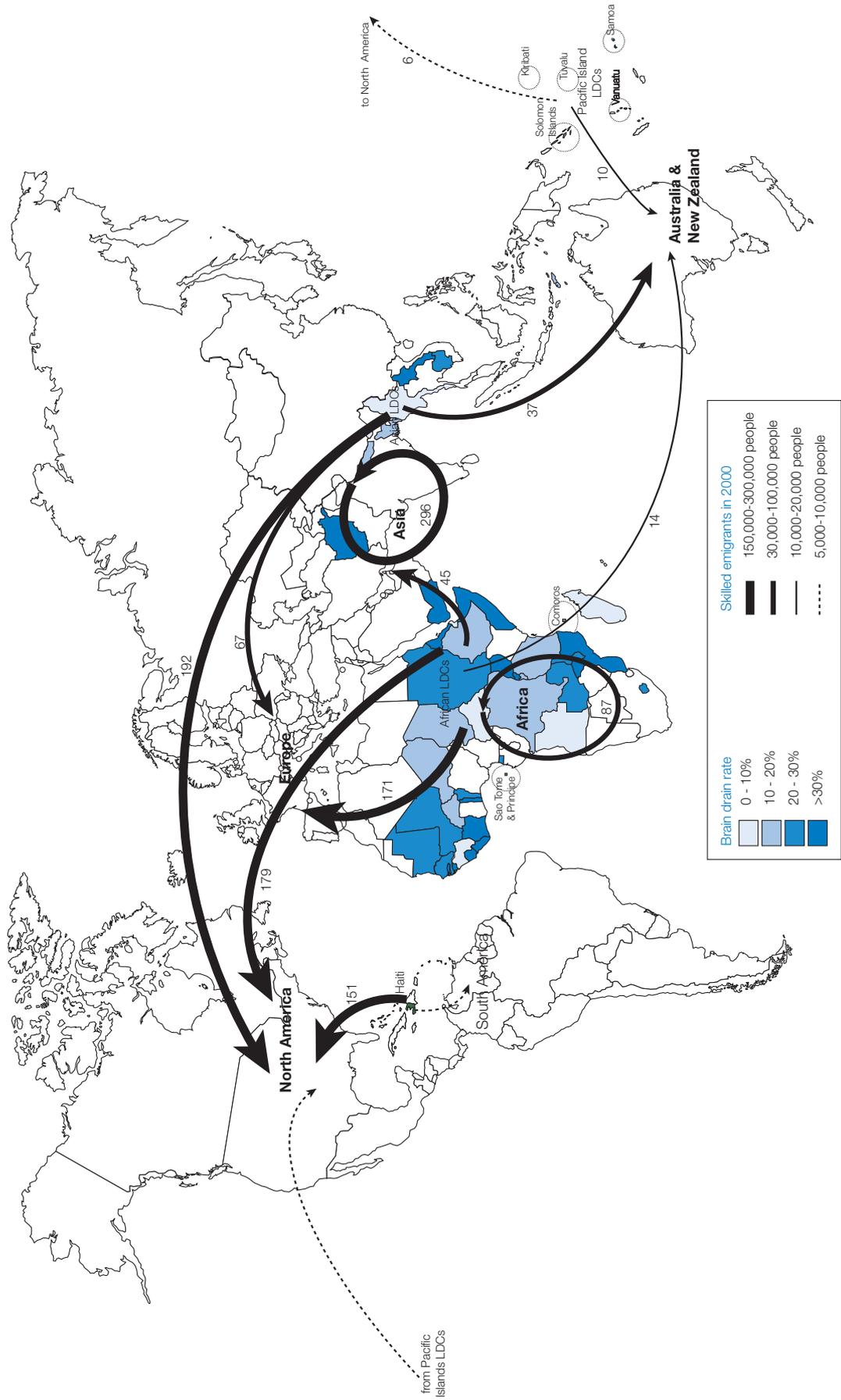
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*The LDCs are by far the group most seriously affected by brain drain.*

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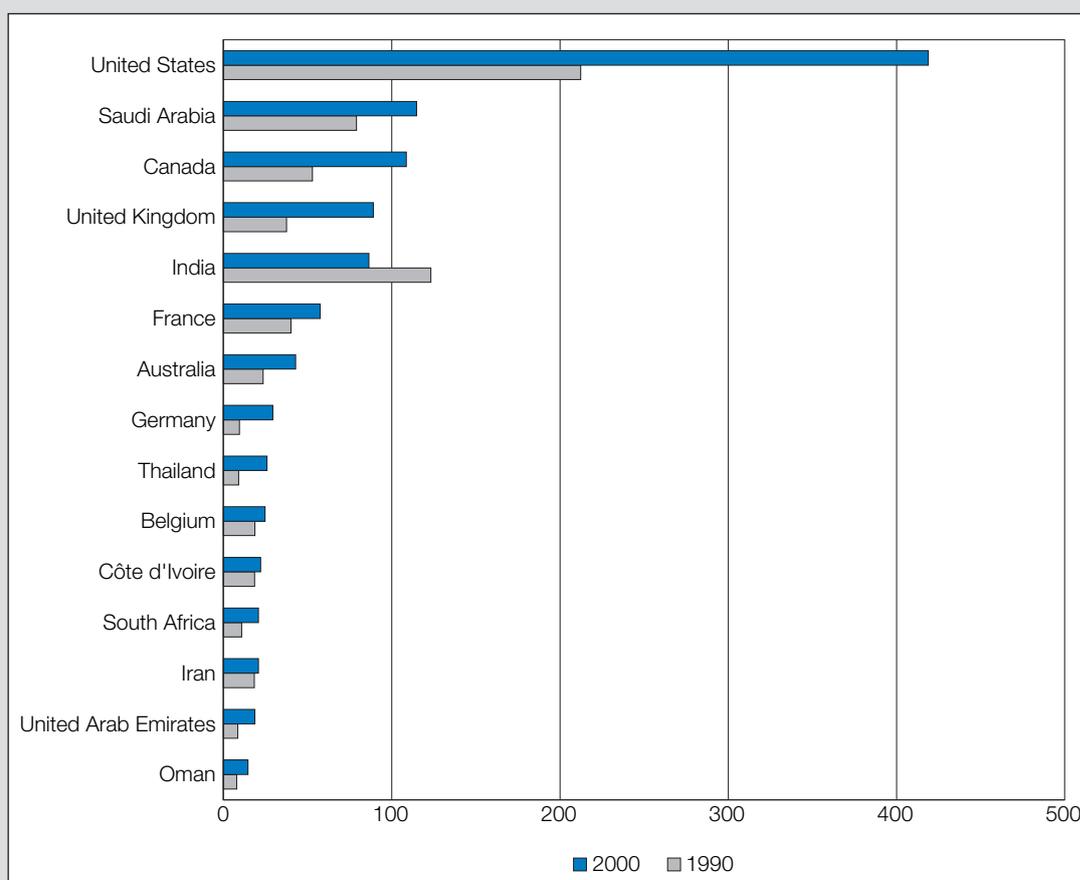
**Brain drain rates.** Collectively, the LDCs are by far the most seriously affected by brain drain among the country groups shown in chart 37. They have an average brain drain rate of 18.4 per cent, much higher than other developing countries (10 per cent). Regionally, the worst affected subgroups are LDCs from the Americas (Haiti), Pacific and Africa, which have higher brain drain rates than all other groups of developing countries except the Pacific ODCs. The LDC regional group with the lowest brain drain rate is Asian LDCs (chart 37).

Chart 34. Main LDC high-skilled emigration corridors



Source: UNCTAD secretariat elaboration based on data from Docquier et al. (2011).

**Chart 35. Major destination countries of high-skilled LDC emigrants, 1990 and 2000**  
(Thousand persons)



Source: UNCTAD secretariat calculations, based on data from Docquier et al. (2011).

The LDCs most affected by brain drain are islands or relatively small African countries. For example, six LDCs have more high-skilled professionals living abroad than at home: Haiti, Samoa, the Gambia, Tuvalu, Kiribati and Sierra Leone. However, the case of Haiti stands out (box 5). Apart from the six LDCs already mentioned, 11 other LDCs also have more than 30 per cent of their high-skilled labour force living abroad. These are mostly African countries (Liberia, Eritrea, Somalia, Rwanda, Uganda, Mozambique, Togo and Guinea-Bissau), and three are Asian LDCs: Yemen, Lao People's Democratic Republic and Afghanistan (chart 38). The majority are post-conflict States.

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*Brain drain has both adverse and beneficial effects on the countries of origin.*

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### 3. ADVERSE IMPACTS

Brain drain has both adverse and beneficial effects on the countries of origin of high-skilled emigrants, as summarized in table 16. While the positive aspects are discussed later in section C, the negative implications are analysed below. The adverse impacts of brain drain can be especially damaging when the countries of origin are developing countries and/or they have a small pool of highly qualified human resources.

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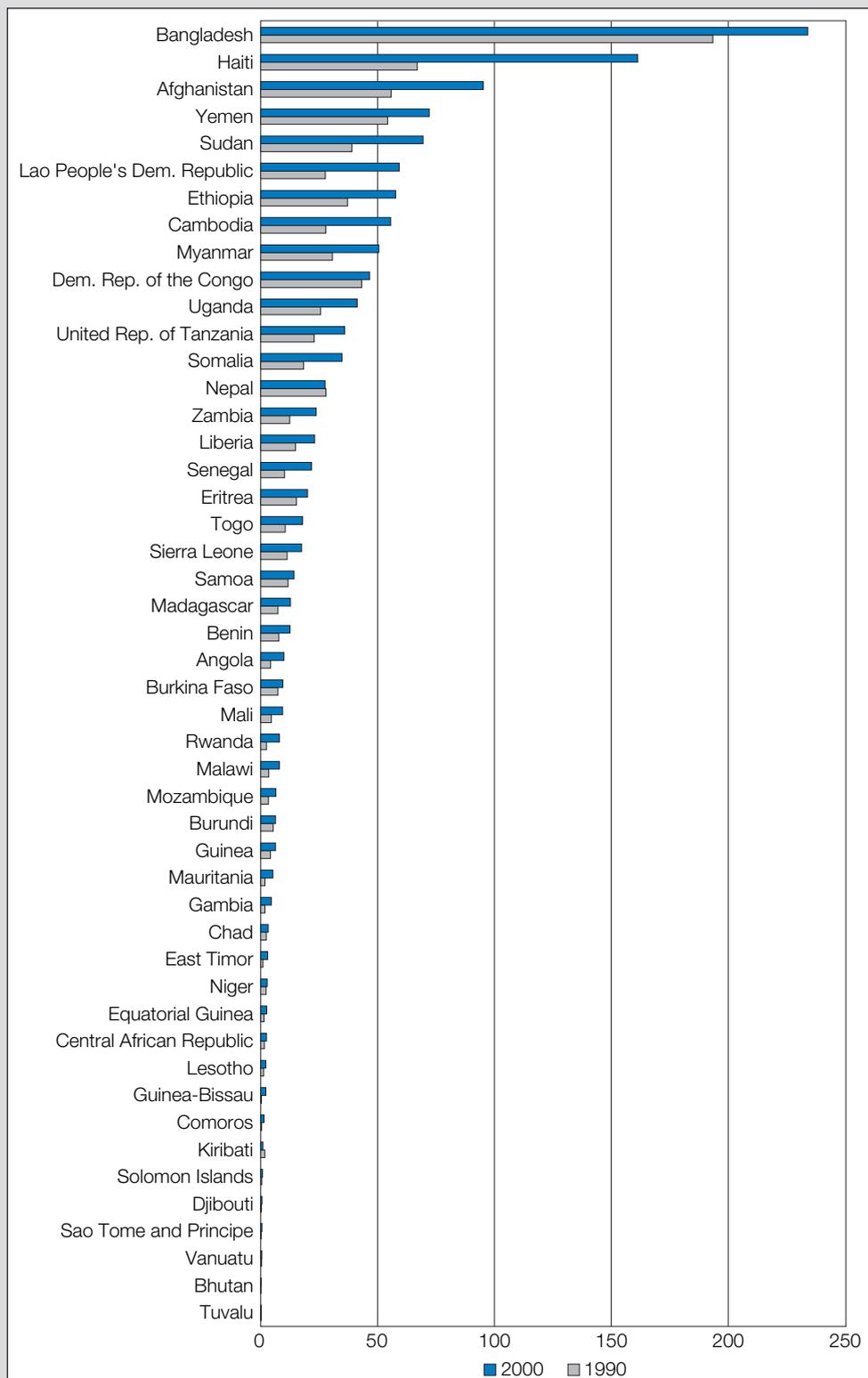
*Brain drain deprives countries of origin of some of the most qualified persons whom they have educated and trained.*

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#### *a) Shrinking human capital stock and slower economic and productivity growth*

Brain drain deprives countries of origin of some of the most qualified persons whom they have educated and trained. In the source country, it reduces the stock of human capital, a factor which is already scarce in developing countries, especially in LDCs (box 6). This effect is particularly strong if a large share of

**Chart 36. Number of skilled emigrants from LDCs, 1990 and 2000**  
(Thousand persons)



Source: UNCTAD secretariat calculations, based on data from Docquier et al. (2011).

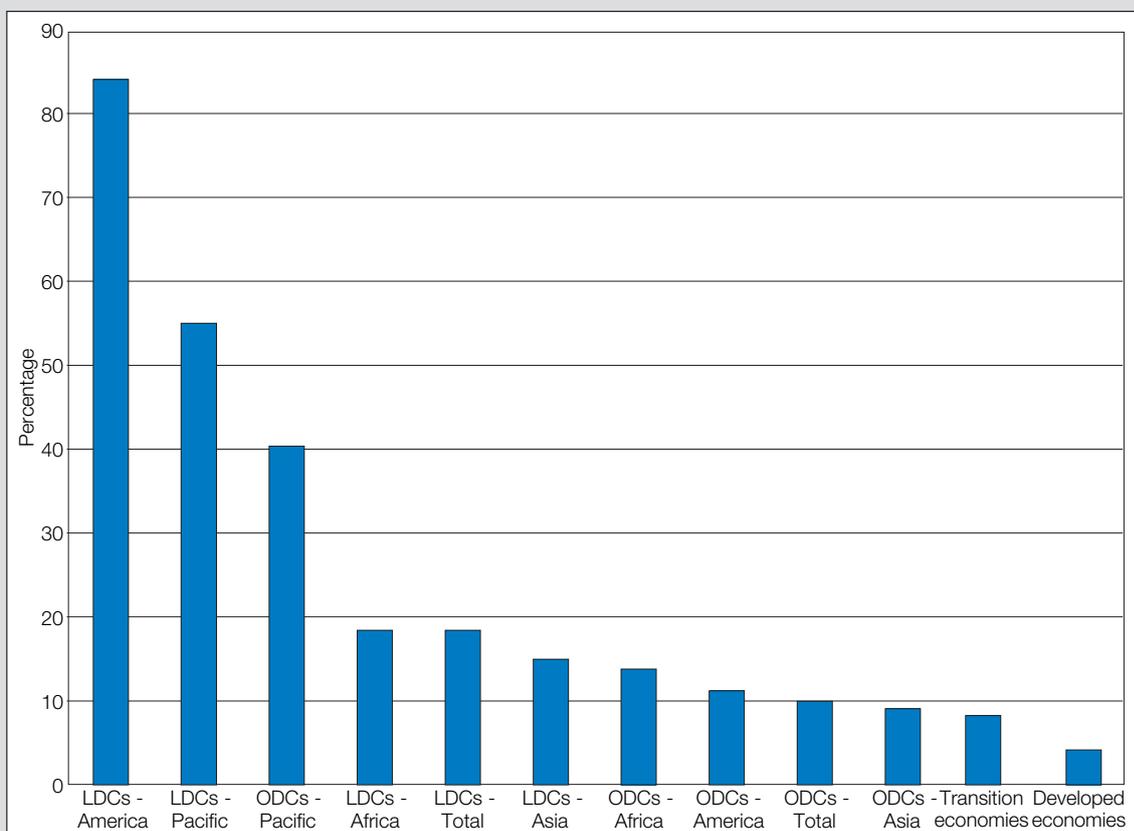
high-skilled people emigrate (Berry and Soligo, 1969; Bhagwati and Hamada, 1974). Given the fundamental role played by human capital in long-term growth and development, brain drain could have the impact of slowing down the origin country's economic growth rate (Miyagiwa, 1991; Haque and Kim, 1995; Wong and Yip, 1999). The adverse impact of shrinking human capital on development is especially acute as the world economy becomes increasingly knowledge-based.

**Table 15. Largest bilateral migration corridors for skilled emigrants from LDCs, 2000**  
(Number of migrants)

Originating LDC	Destination country	Skilled migrant stock
Haiti	United States	126,524
Bangladesh	India	70,092
Bangladesh	United States	41,920
Lao People's Democratic Republic	United States	41,440
Bangladesh	Saudi Arabia	41,222
Yemen	Saudi Arabia	39,200
Ethiopia	United States	34,428
Cambodia	United States	32,955
Haiti	Canada	24,475
Sudan	Saudi Arabia	22,399
Afghanistan	Iran	20,715
Afghanistan	United States	19,246
Liberia	United States	18,436
Democratic Republic of the Congo	Belgium	18,428
Myanmar	United States	18,047
Uganda	United Kingdom	17,600
Myanmar	Thailand	15,742
Bangladesh	United Kingdom	15,507
Afghanistan	Germany	14,519
Bangladesh	Oman	12,625
United Republic of Tanzania	Canada	12,220
Nepal	India	11,179
Bangladesh	Canada	11,065
United Republic of Tanzania	United Kingdom	10,535

Source: UNCTAD secretariat calculations based on data from Docquier et al. (2011).

**Chart 37. Brain drain rate of country groups, 2000**  
(Percentage)



Source: UNCTAD secretariat calculations, based on data from Docquier et al. (2011).

Note: The brain drain rate is the emigrants' share of the corresponding age and educational group in the home country.

### Box 5. Brain drain and the labour market in Haiti

Most LDCs with very high brain drain rates are countries with a small population. Haiti is an exception. Its population was 8.6 million in 2000 and currently stands at 10.3 million. Yet it has the highest brain drain rate of all LDCs (83.4 per cent). This places Haiti worldwide among the countries most affected by brain drain, since only six other countries have brain drain rates above 80 per cent.

Labour market conditions in the country largely explain the extent of brain drain, according to the national case study prepared for this Report. Although some 200,000 people enter the labour market every year, labour demand does not even represent 10 per cent of this supply. Moreover, almost half of all Haitians over 65 continue to work, due to the lack of a well-functioning retirement pension system. The chances of finding a job are higher for university graduates than for secondary-educated people, but they are still low. Nevertheless, this situation acts as an incentive with regard to higher education, although the additional supply of skills is not met by demand.

A major job website for qualified professionals posted 2,230 positions between 2008 and 2010. Based on the highly conservative assumption that only five per cent of available jobs are advertised, this would bring the total number of jobs to 44,600 for the three-year period, far from matching a labour market supply of 600,000. In view of this labour supply mismatch, especially for skilled labour, there are only two options: resort to informality, which is already the main sector of employment in the country,<sup>1</sup> or emigrate. Orozco (2006) points out that close to 90 per cent of Haiti's skilled emigrants moved abroad due to lack of job opportunities.

Apart from the very difficult conditions of the labour market, other features push skilled Haitians abroad, such as insecurity and the political situation. Conditions were worsened by the earthquake of 2010. It is estimated that after this natural disaster, one-third of the remaining high-skilled persons living in the country decided to emigrate.

<sup>1</sup> Some 57 per cent of employment in Haiti takes place in the informal sector (IHSI, 2010).

**Table 16. Possible effects of brain drain on (developing) home countries**

Effect types / Processes	Adverse	Beneficial
<b>Knowledge and human capital</b>	<ul style="list-style-type: none"> <li>Shrinking human capital base</li> <li>Less innovation</li> <li>Sectoral impacts, especially health and education</li> <li>Brain waste</li> </ul>	<ul style="list-style-type: none"> <li>Brain gain</li> <li>Transfer/sharing of skills/technology</li> <li>Diaspora knowledge networks</li> <li>Accumulation of broader/deeper knowledge/skills/experience</li> </ul>
<b>Macroeconomic processes</b>	<ul style="list-style-type: none"> <li>Slower economic growth</li> <li>Declining high-skill labour externalities</li> <li>Lower productivity growth</li> <li>Less entrepreneurship</li> <li>(Fiscal) cost of educating high-skilled persons</li> <li>Foregone taxes paid by high-skilled persons</li> </ul>	<ul style="list-style-type: none"> <li>Returnee entrepreneurship</li> </ul>
<b>Trade / capital flows</b>	<ul style="list-style-type: none"> <li>Changing relative resource endowments away from skills</li> </ul>	<ul style="list-style-type: none"> <li>Remittances</li> <li>Diaspora savings: bonds, deposits, loans, funds, etc.</li> <li>Diaspora effects and business networks:               <ul style="list-style-type: none"> <li>creation/strengthening of trade flows: merchandise and services (e.g. tourism)</li> <li>creation/strengthening of foreign direct investment</li> </ul> </li> </ul>
<b>Institutional processes</b>	<ul style="list-style-type: none"> <li>Lower supply of/demand for institutions</li> </ul>	<ul style="list-style-type: none"> <li>Diaspora assistance in/pressure for institution-building</li> <li>Returnee supply of/demand for institutions</li> </ul>

Source: UNCTAD secretariat.

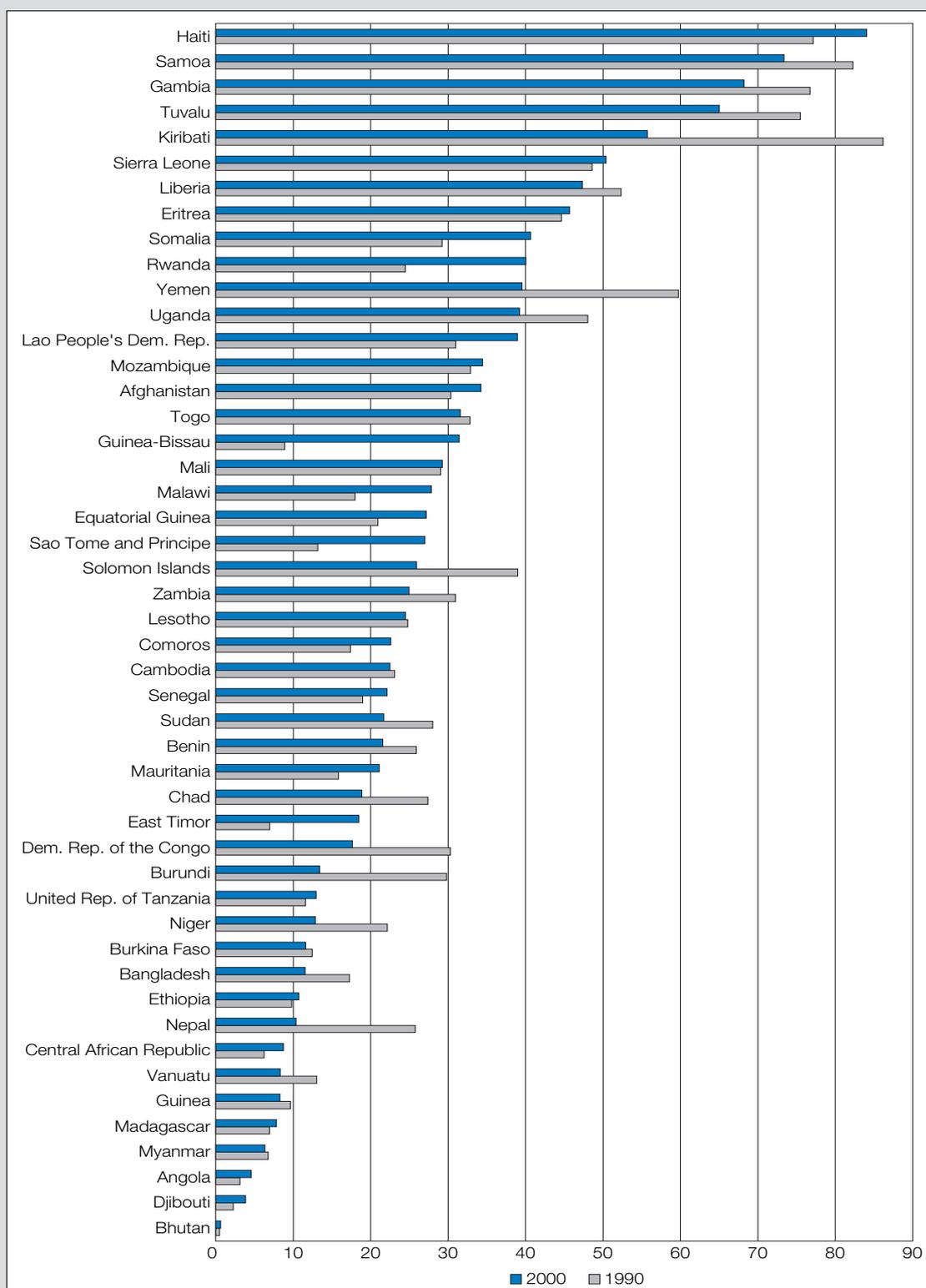
Note: The table presents the potential effects of brain drain which can generally affect home economies negatively or positively. The actual impact on individual countries depends on their specific conditions and on their level of economic, social and institutional development.

Brain drain reduces welfare due to the loss of externalities. The high-skilled labour force tends to have a positive externality on the rest of the labour force, since the latter emulates the better qualified workers and thereby achieves higher productivity. Therefore, the positive impact of highly talented persons goes well beyond their small numbers in the population. If many of the most highly skilled workers leave the country, this externality is considerably reduced (Haque, 2005).

*Brain drain can have an adverse effect on local science and knowledge systems.*

Apart from this general formulation on human capital, brain drain can have an adverse effect on local science and knowledge systems (box 7 provides the example of Ethiopia), impairing the economy's capacity to produce and

**Chart 38. Brain drain rate of LDCs, 1990 and 2000**  
(Percentage)



Source: UNCTAD secretariat calculations, based on data from Docquier et al. (2011).

implement innovation. This, in turn, slows down productivity growth (Kapur and McHale, 2005; Agrawal et al., 2011). Schiff and Wang (2009) empirically estimate that higher brain drain rates reduce the technological absorptive capacity of home countries and thereby the degree to which they incorporate technological innovation. As a result, brain drain could lead to lower productivity growth.

### Box 6. Human capital endowments and international labour and resource flows

Least developed countries have relatively more low-skilled than high-skilled labour. In the LDCs, the ratio of the former to the latter is 42. This is more than double the level in other developing countries (16) and more than ten times higher than in developed countries, where the ratio is just 4.<sup>1</sup> Prima facie, it could be expected that high-skilled labour has the highest return where it is relatively scarcer, i.e. in developing countries and especially in LDCs. Therefore, highly qualified labour should apparently flow to the latter countries, where human capital is most scarce and knowledge stocks are lowest. In absolute figures, the prediction of the conventional view is verified: low-skilled emigration from LDCs outpaces high-skilled emigration by a ratio of 11. Yet this same ratio shows that LDCs are exporting high-skilled labour more intensively than low-skilled labour, since the low/high-skilled ratio of “labour exports” (i.e. emigration) corresponds to just one-fourth of the ratio of endowments. Another way of measuring the relative “export intensity” at the different skill levels is through the emigration rates for low-skilled and high-skilled labour.<sup>2</sup> In 43 out of the 48 LDCs, the emigration rate of high-skilled labour is higher than that of low-skilled labour, and the opposite is true in only five of these countries.

The above data reveal that the vast majority of LDCs export high-skilled labour more intensively than low-skilled labour. This finding contradicts the expectations mentioned above based on apparent returns to knowledge. The explanation for this apparent paradox seems to lie in the particular nature of human capital embodied in people. Knowledge is subject to increasing returns and to positive agglomeration effects. Agglomeration economies generate centripetal forces, so that human resources tend to agglomerate in locations which already have a considerably stock of qualified persons. Agglomeration leads to higher productivity and earnings in these locations. For instance, Clemens et al. (2008) estimate that on average, Haitians moving to the United States boost their incomes almost sevenfold. Beyond earnings differentials, the significance of agglomeration effects is particularly strong for research and scientific production, which depend on the availability of scientific infrastructure (laboratories, measurement instruments, specific materials, sophisticated machinery, access to databases and libraries, interaction with colleagues, face-to-face discussions and collaboration, etc.).

South–North migration of high-skilled labour amounts to an international transfer of (human) resources from the poorest countries to the richest. Similarly, South–South flows of high-skilled people from LDCs (around one-third of the total) are directed to developing countries with a relatively higher development and income level.

<sup>1</sup> Data are for 2000, the year for which the latest bilateral high-skilled migration matrix is available.

<sup>2</sup> The emigration rate is the number of emigrants divided by the corresponding skill and age group. In the case of high-skilled labour, it is the brain drain rate.

### Box 7. The effects of brain drain on higher education and academic research in Ethiopia

The exponential growth of higher education in Ethiopia over the last 15 years (section C1) hides the extent to which the sector is adversely affected by brain drain. The number of students graduating at the bachelor’s level rose sharply from 29,800 in 2007 to 75,300 in 2011. At the same time, however, the corresponding figure for higher level education (master’s and PhD) rose much more moderately: from 2,700 to 6,200.

As a result, there is a dearth of people with doctorate-level degrees in Ethiopia, and this is especially true where they are most needed, i.e. in higher education. Among the 15,192 teachers and researchers working in the country’s 25 universities, only 979 (6.4 per cent) hold a doctoral degree. Moreover, PhD holders are very unevenly distributed, since half of them work at the University of Addis Ababa. The bulk of the country’s university teachers and researchers have only a master’s degree (43.4 per cent) or a bachelor’s degree (42.6 per cent). Ethiopian higher education institutions sorely lack very high-skilled people.

The number of PhD-holding teachers and researchers active in the country’s universities is much lower than the members of the Ethiopian diaspora just in the United States and Canada who have that level of education: 1,600, according to conservative estimates. The case study on the Ethiopian academic diaspora prepared for this Report identified 200 Ethiopian professors currently working in foreign universities, of whom 148 are active in the United States. Among these, 72 are full professors. In Ethiopia, by contrast, only 65 persons hold an equivalent position. In other words, there are more Ethiopian full professors working in the United States than in Ethiopia itself, in spite of the strong need of Ethiopian universities for very highly skilled people.

In order to respond to the stringent need for more qualified university teachers and professors, the Ethiopian Government has launched a campaign to recruit 631 teachers and researchers, especially from India. Whether this programme will succeed is not yet clear. Nevertheless, if properly implemented, its implications for the country’s limited foreign exchange will be significant.

Brain drain can also comprise entrepreneurs and students (i.e. future professionals). The former’s departure deprives the home country of some of the people who create businesses and employment. As for students, most developing countries send some of them abroad for tertiary-level studies, as a means of expanding and improving the human capital stock of the home country. However, this often becomes a route to brain drain. The greater the gap between the conditions in the study country and those in the home country, the higher the probability of graduates staying abroad (Finn, 2010), which shrinks the human capital base of the home country.

### *b) Sectoral impacts*

The impact of reduced availability of qualified professionals could be more acute in some sectors, for instance education and scientific activities (box 7) and health (box 8). These are the main sectors responsible for building and improving countries' human capital endowment. Their malfunction due to brain drain hampers the continuing formation of human capital, which in turn is likely to depress the national long-term growth rate.

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*The impact of reduced availability of qualified professionals could be more acute in some sectors, for instance education and scientific activities.*

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### *c) Fiscal costs and foregone revenues*

Expanding a country's human capital base through education has a high cost, which is financed to a large extent by the State.<sup>8</sup> Typically, the persons thus trained work, live and pay taxes in the home country upon completion of education (at whatever level). This allows the State to partly recoup the investment through the taxes (income, property, indirect, etc.) generated by these people. In the case of brain drain, however, this payback does not occur, because emigrants generally live, work and pay taxes abroad (Bhagwati and Hamada 1974; Grubel and Scott 1966; Berry and Soligo 1969; Johnson 1967; Kwok and Leland 1982). Although these effects take place for all sorts of migrants, they are strongest in the case of high-skilled migrants. Their education costs the most for the home country and, since they have the highest earnings, the corresponding foregone fiscal revenues are the highest. Gibson and McKenzie (2010) present the results of survey micro-data for high-skilled emigrants from Tonga, Federated States of Micronesia, Papua New Guinea, Ghana and New Zealand. The developing countries in the sample share several structural characteristics with Pacific and African LDCs. They estimate the net annual fiscal cost per high-skilled emigrant at \$6,300–16,900 in Ghana and Papua New Guinea, but a much lower \$500–1,000 in Tonga and Micronesia, which have very low tax rates.<sup>9</sup>

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*If brain drain is significant, it can alter the relative resource endowment of both origin and destination countries.*

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### *d) Changing relative resource endowments*

If brain drain is significant, it can alter the relative resource endowment of both origin and destination countries. By reducing the human capital stock of countries of origin, it tilts the relative factor endowment of the domestic economy towards other factors (e.g. natural resources), thereby altering the patterns of comparative advantage. At a minimum, it can reinforce the home country's specialization away from skill-intensive sectors or activities.<sup>10</sup> Worldwide, tertiary graduates tend to agglomerate in the United States, the United Kingdom, Australia, Canada and some other developed countries. The pre-existing polarization of the geographical distribution of talent is reinforced by the South–North migration of high-skilled people. These flows amount to a net transfer of resources from the country of origin to the country of destination (box 6).

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*The degree of brain waste depends to a large extent on home country characteristics.*

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### *e) Brain waste*

In the context of international labour mobility, brain waste refers to the fact that some immigrants can only find jobs in the host country which are below the skills corresponding to their education level. This happens for instance when medical doctors work as nurses or university graduates work as taxi drivers or waiters. The degree of brain waste depends to a large extent on home country characteristics. In the case of the United States, Mattoo et al. (2008) note that the probability of skilled immigrants finding a job corresponding to their education level rises with the income level of the country of origin and with the level of the latter's expenditure on education. Educated immigrants from Latin America, Eastern Europe and Africa are more likely to take jobs below their education skill level than immigrants from Asia and industrial countries. In

### Box 8. Medical brain drain

LDCs form the group of countries with the lowest medical density: 0.12 physician/1000 inhabitants, well below the acceptable threshold recommended by the World Health Organization of 2/1000. The medical density in other developing countries is nine times higher than in LDCs, whereas in developed countries it reaches a multiple of 24. The emigration of doctors from developing countries aggravates these disparities: LDCs also have the highest rate of medical brain drain, i.e. the number of nationally trained physicians who work abroad as a share of those who work at home or abroad. This rate is highest in Haiti (35 per cent) and African LDCs (14 per cent) (box chart 2).<sup>1</sup> Medical brain drain has been growing since the 1990s in both the LDCs and in other developing countries.

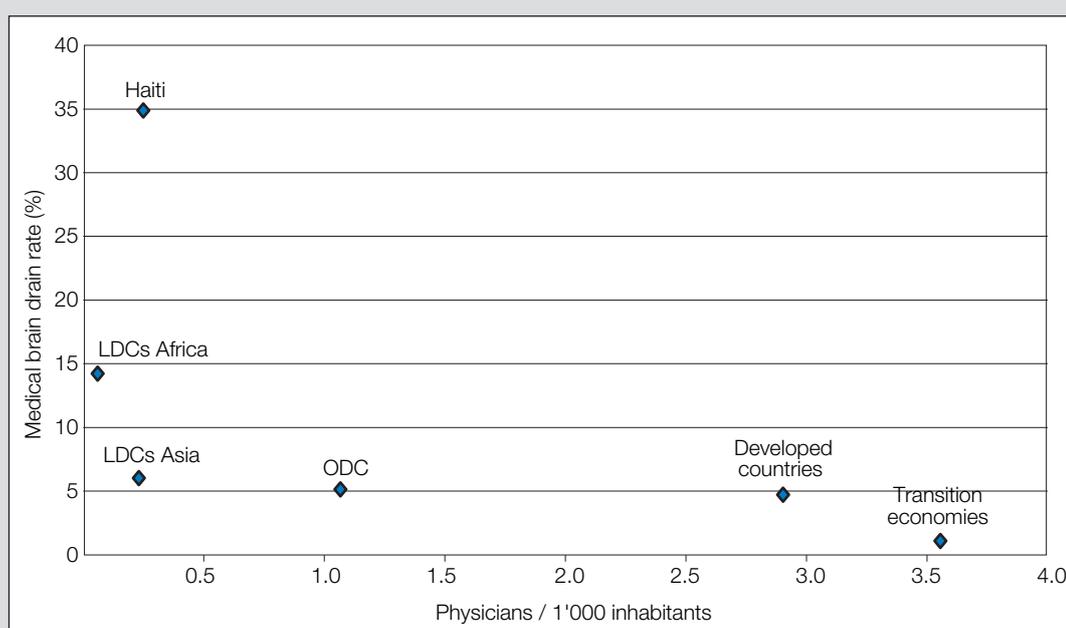
In the case study on Ethiopia prepared for this Report, it is estimated that around 1000 Ethiopian medical doctors work in the United States, whereas the number of physicians working in the home country in 2009 was 2,154. Therefore, it can be surmised that out of all Ethiopian doctors, between one-third and one-half work abroad. Bangladesh has a physician density of 0.25/1000 inhabitants and 32 medical schools. Some 2,000 persons graduate annually, of whom some 300 emigrate. Although the share is low, these are generally the best and the brightest. The quality of medical research and intellectual development at the top institutions in the country suffers from this brain drain (Rahman and Khan, 2007).

The main development problems associated with medical brain drain in LDCs are its impacts on the health of the population and the cost of medical education in these countries. Higher brain drain rates are associated with higher infant and child mortality and lower vaccination rates in developing countries, as well as higher adult mortality due to AIDS in the case of sub-Saharan Africa (Bhargava et al., 2011; Bhargava and Docquier, 2008). They also have an indirect negative impact on medical research and innovation in home countries. More broadly, the adverse impact on national health systems has long-term negative consequences on the human capital formation and accumulation of LDCs. Still, brain drain is only one factor in the sub-standard performance of health systems in most LDCs. In various African countries, a number of doctors and nurses are inactive or unemployed, indicating that understaffing of health systems is also due to factors other than brain drain (Skeldon, 2005).

The education of doctors has a very high cost for LDCs, and medical brain drain largely prevents these countries from recouping the educational investment made. It has been estimated that the full cost of educating a medical doctor in sub-Saharan Africa from primary school to university is \$66,000, while the corresponding cost of educating a nurse is \$43,000. If this investment is lost to the home country, the opportunity cost could be at least \$364,000 and \$238,000, respectively, for each emigrated professional (Kirigia et al., 2006). These amounts far exceed the remittances that these professionals could send home during their working life.

<sup>1</sup> These rates are low as compared with those for total brain drain quoted in the main text. This is due to methodological differences in computing both sets of rates. The present ones are based on the country of training and on emigration to just 12 developed countries. By contrast, the figures for total brain drain in the main text are based on nationality or country of birth and on all host countries. Clemens and Pettersson (2008) estimate medical brain drain for African countries based on physicians' country of birth and reach rates much higher than the ones quoted in this box. Their median medical brain drain rate for African LDCs is 39 per cent, as opposed to 14 per cent in the database used in the present box. These authors do not provide data for non-African countries.

Box chart 2. Medical brain drain and physician density by country groups, 2004



Source: UNCTAD secretariat calculations, based on data from Bhargava et al. (2011).

other words, the lower the economic and institutional development of the home country, the more likely that brain waste takes place.

These findings can be expected to apply to LDCs. The occupational profile of high-skilled emigrants from some of these countries deteriorates with emigration, according to survey data. Comparing the occupations of tertiary-educated migrants from Uganda, Senegal and Burkina Faso before and after migration shows an abrupt fall in the share of managerial posts (by at least 15 percentage points). By contrast, the share of persons performing technical and associated professional occupations rises strongly (by 19 percentage points in the case of Senegal) (table 17). Similarly, in interviews undertaken for this Report with a sample of high-skilled Haitian emigrants living in the United States, Canada, France and Spain, 47 per cent indicated that their present job requires less knowledge than what they had acquired in the home country. Nevertheless, 16 per cent stated that it required the same level and 38 per cent indicated higher skill requirements than those mastered before emigration.

*The departure of the most qualified people potentially reduces both the demand and the supply of the institutions required for development.*

#### f) Institution-building

Typically, the most skilled people are those who are best qualified to build and run institutions which are required for the national development process (State and government institutions, policymaking organizations, political debate, etc.).<sup>11</sup> At the same time, the most qualified people are those who are most likely to demand good-quality institutions and press for them. Their departure therefore potentially reduces both the demand and the supply of the institutions required for development and may slow the long-term development of the home country.

*The net impact of brain drain on home countries depends to a large extent on the intensity of brain drain.*

## 4. IMPLICATIONS FOR LDCs

Lack of more comprehensive data makes it difficult to estimate the exact impact of brain drain on home economies, especially LDCs. Existing research has postulated that the net impact of brain drain on home countries depends to a large extent on the intensity of brain drain, though this relationship is not always linear. Some degree of brain drain may be tolerated because of its potential positive effects (discussed in section C below). By contrast, at high brain drain rates, the negative consequences mentioned above are likely to predominate, as they tend to outweigh the positive effects. Therefore, it has been posited that there is some "optimal" level of brain drain, at which the net balance of positive and negative effects on the domestic economies reaches the

**Table 17. Occupation of high-skilled international migrants from selected LDCs in home and host countries, 2009**

Occupation	Home country					
	Uganda		Senegal		Burkina Faso	
	Where occupation performed					
	Home <sup>a</sup>	Host <sup>b</sup>	Home <sup>a</sup>	Host <sup>b</sup>	Home <sup>a</sup>	Host <sup>b</sup>
Managers <sup>c</sup>	54.9	3.0	27.7	8.7	48.7	33.7
Professionals	10.9	29.4	18.3	0.6		30.9
Technicians and associate professionals	3.5	10.9	17.4	36.3		
Clerical support workers	1.2	5.7	1.5	8.8		
Service and sales workers		11.7	1.1	1.4		
Other	18.7	12.9	33.3	9.2	-	-
Don't know	10.9	26.5	0.6	35.0	51.3	35.5
<i>Memo item: Share of high-skilled out of international migrants surveyed</i>		31.5		6.6		0.4

Source: UNCTAD secretariat calculations based on data from the World Bank Migration and Remittances Household Surveys 2009 (available at <http://microdata.worldbank.org/index.php/catalog/534>).

a Occupation performed in home country before migration.

b Occupation currently performed in the host country (in 2009, date of the surveys).

c Includes "Senior management employees" in the case of Burkina Faso.

maximum level. It has been estimated that an “optimal” high-skilled emigration rate lies between five per cent and 10 per cent of the high-skilled workforce, on the basis of a series of empirical studies on the effects of brain drain (Docquier, 2006). By contrast, “high” brain drain rates are considered to be those above the 15–20 per cent range. Beyond this level, the likelihood increases that the negative impacts of brain drain will outweigh its positive consequences.

The actual brain drain rate is “high” in 30 of the 48 LDCs; conversely, it is close to the “optimal” level in only five of these countries. Given the intensity of the phenomenon in these countries, it is likely that economic development in most LDCs has been adversely affected both directly and indirectly. It is, however, not possible to arrive at a precise estimate of the magnitude of its macroeconomic impact in terms of economic or productivity growth rates. Concerning sectoral impacts, by contrast, there is ample evidence of the adverse effect of brain drain on LDCs, especially with regard to health, education and science, technology and innovation (STI). The poor performance of STI in LDCs has adverse second-round impacts across all economic sectors and on LDCs’ development of productive capacities (UNCTAD, 2007: 139–160), although brain drain is not the only factor explaining such poor performance.

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## C. Turning brain drain into benefits for home countries

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Since the 1990s, the so-called “new economics of the brain drain” has argued that brain drain can be beneficial to developing countries, through the so-called “beneficial brain drain” or “brain gain”.<sup>12</sup> This potential positive effect of labour migration comes alongside other possible beneficial effects of labour migration, which were already recognized by the early literature on migration but have recently received increased attention (table 18). These beneficial effects are presented below and their operation in LDCs is analysed.

### 1. BRAIN GAIN

**Beneficial brain drain.** The brain gain literature argues that brain drain raises returns to education, providing an incentive for people to obtain additional education in order to increase their chances of emigrating. Out of these educated people, many emigrate (i.e. brain drain). At the same time, some eventually do not settle abroad and thereby help raise the human capital endowment of the home country with respect to what would have been the case if the migration incentive had not been present (i.e. a net brain gain). The evidence on the benefits of migration stressed by the new migration literature is still inconclusive (Solimano, 2010). Schiff (2006) questions the assumptions and conclusions of this literature, arguing that the actual brain gain effect is smaller than what these authors claim and that they fail to take into account several negative externalities caused by brain drain. Still, both he and these authors agree that the net impacts of brain drain on home countries vary with brain intensity and are negative for countries with high brain drain rates.

Tertiary education has been expanding in most LDCs since the 1990s. Between 1999–2000 and 2009–2010, the number of graduates in all tertiary-level programmes in a sample of 16 LDCs more than doubled from 182,000 to 455,000, which corresponds to a 19 per cent annual growth rate.<sup>13</sup> This has been driven by the efforts of the educational sector – mainly public but also private – to respond to previously unmet demand for university-level education in many LDCs.<sup>14</sup> However, it is difficult to attribute this rapid expansion in higher

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*The actual brain drain rate is “high” in 30 of the 48 LDCs; conversely, it is close to the “optimal” level in only five of these countries.*

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*There is ample evidence of the adverse effect of brain drain on LDCs, especially with regard to health, education and STI.*

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*The net impacts of brain drain on home countries are negative for countries with high brain drain rates.*

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*While part of the repressed demand for tertiary education may have had the motivation of emigration, it has probably not been the most important one.*

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education to the incentive effect of emigration prospects. While part of the repressed demand may have had this motivation, it has probably not been the most important one. In recent decades, the rate of growth of university-level education in LDCs has far outpaced that of high-skilled emigration. Among the sample of Haitian qualified emigrants interviewed for this Report, none indicated the prospect of emigration as a motivation for obtaining tertiary education. In the case of Bangladesh, the case study carried out for this Report indicated that if emigration had been a major motivation for university education, the subjects chosen most frequently would have been different from the actual ones.<sup>15</sup>

Given the difficulties of making direct empirical measures of brain gain, Beine et al. (2008) perform an econometric estimation of the impact of emigration prospects on human capital formation. They find a positive effect for countries at all income levels. However, in order to estimate the net effect after accounting for emigration, they compare the actual human capital stock to what it would have been if high-skilled workers had been allowed to emigrate at the same rate as low-skilled workers. In the case of the LDCs, the negative effect of brain drain on human capital formation predominates (in 20 out of 41 countries) and it is nil in 11 countries, due to the high rates of brain drain in these countries. The effect is positive (i.e. net brain gain) in only 10 LDCs and even there its intensity is low, since the estimated impact is at most an expansion of 0.2 percentage points in the proportion of the high-skilled in the labour force. These findings confirm that the brain gain effect of high-skilled emigration is largely absent from most LDCs.

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*In LDCs, the negative effect of brain drain on human capital formation predominates (in 20 out of 41 countries) and it is nil in 11 countries.*

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**Broader meaning of brain gain.** Besides the technical meaning of brain gain postulated by the “new economics of the brain drain” as mentioned above (i.e. the additional education taken thanks to the migration motivation but which does not actually lead to brain drain), “brain gain” is commonly used in a broader sense. As such, it refers to the expansion of human capital, skills and knowledge which accrue to the home country as an indirect effect of migration, but working through other channels. This includes the use of remittances for education, temporary return of high-skilled diaspora members or definitive return of qualified emigrants.

In home countries, remittances can be used to pay for education, so that recipients of those flows can either finance additional education or avoid taking children out of school (Özden and Schiff 2006; Acosta et al., 2007). In such cases, remittances release the liquidity constraint preventing further education. Evidence on the use of remittances in LDCs (section C2 of chapter 3 of this Report) seems to indicate that the mechanism is at work in some of these countries.

The other channels of “brain gain” in this broader meaning are analysed in sections C3 to C5 below.

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*In home countries, remittances can be used to pay for education.*

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## 2. FINANCIAL FLOWS

The most tangible positive impacts of both high- and low-skilled migration are the financial flows to the home country that they generate. These flows are mainly remittances, diaspora bonds and foreign direct investment (FDI). The trends and economic impacts of remittance to LDCs are analysed in detail in chapter 3 of this Report. Therefore, this section focuses on two issues: 1. differences in remitting patterns between emigrants according to their skill profile; and 2. whether remittances offset the costs of brain drain. Diaspora bonds are mentioned in this section, while diaspora FDI is discussed in section C4 below.

### a) Brain drain and remittances

It is often difficult to differentiate between remittances flows generated by high-skilled and low-skilled emigrants. However, some recent evidence suggests that high-skilled emigrants have a lower propensity to send remittances but those who do send money transfer larger amounts than the low-skilled emigrants, thanks to their higher earnings abroad (Bollard et al. 2011). The contribution of high-skilled emigrants to total remittances thus depends on their propensity to remit and on their share of total migrant stocks.

Available data for LDCs reveal mixed patterns. High-skilled emigrants have a lower propensity to remit in Senegal, but the opposite is true in Uganda and Burkina Faso. The average amount sent home by high-skilled remitters is predictably a multiple of that of low-skilled emigrants (except for Senegal, where the difference is very small). Consequently, the contribution of high-skilled remitters to the total flow of remittances to the home country is higher than their share of the group of emigrants who do send money home. In Uganda, where almost half of the international remitting emigrants are high-skilled, they account for two-thirds of total remittance flows to the country. In Senegal and Burkina Faso, by contrast, where only a fraction of the remittance-sending emigrants are tertiary-educated, their contribution to total remittances flows is less than 10 per cent (table 18).

### b) Brain drain costs and remittances

While data on remittances have been calculated and/or estimated and made publicly available, there is no comparable information on the costs and benefits of brain drain. Given the complexity of the multiple impacts of brain drain (table 16) it is very difficult to compute the welfare gains/losses of home and host countries, especially with regard to the associated externalities (both positive and negative) and the value of knowledge flows. Haque (2005), for instance, argues that remittances should not be compared with the externalities generated by human capital.

Nevertheless, some attempts have been made to appreciate the net results of some of the effects. Easterly and Nyarko (2009) estimate that in Ghana, remittances exceed costs of training tertiary brain-drained citizens (when only the cost of tertiary education is considered). They claim that as long as the remittances of the typical person exceed 30 per cent of GDP per capita of the home country, they exceed the cost of (tertiary) education. LDC mean remittances correspond to four per cent of GDP per capita, exceeding 30 per

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*High-skilled emigrants have a lower propensity to send remittances but those who do send money transfer larger amounts than the low-skilled emigrants.*

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*High-skilled emigrants have a lower propensity to remit in Senegal, but the opposite is true in Uganda and Burkina Faso.*

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*While data on remittances have been estimated, there is no comparable information on the costs and benefits of brain drain.*

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**Table 18. Emigrant skills and remittance patterns in selected LDCs, 2009**

(Percentage, unless otherwise indicated)

	Home country		
	Uganda	Senegal	Burkina Faso
Remitting propensity of international migrants (share of migrants who ever sent remittances)			
Low-skilled	27.9	78.8	60.8
High-skilled	51.1	60.6	76.8
Annual amount of money sent per remitter (\$)			
Low-skilled	782	1538	98
High-skilled	1882	1545	679
Composition of group of emigrants who ever sent remittances			
Low-skilled	54.2	94.9	99.5
High-skilled	45.8	5.1	0.5
Origin of total remittances sent			
Low-skilled	33.2	94.8	96.9
High-skilled	66.8	5.2	3.1

Source: UNCTAD secretariat calculations, based on data from the World Bank Migration and Remittances Household Surveys 2009 (available at <http://microdata.worldbank.org/index.php/catalog/534>).

cent in only one case (Lesotho) (table 6, chapter 3).<sup>16</sup> Thus, indications are that remittances do not offset the costs of educating people who leave the country (even if computing solely the costs of higher education). Therefore, it is more likely that these countries lose out on balance when comparing costs of education and remittance receipts.

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*Indications are that remittances do not offset the costs of educating people who leave the LDCs.*

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### *c) Other financial flows*

Beyond remittances, diasporas can also be a source of savings, which can be channelled as capital inflows to home countries. Home-based economic agents such as governments mobilize these savings through diaspora bonds and other financial instruments like deposit accounts, transnational loans and diaspora mutual funds (Terrazas, 2010). Among LDCs, Ehtiopia, Nepal and Rwanda have issued diaspora bonds.

## 3. DIASPORA KNOWLEDGE NETWORKS

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*Beyond remittances, diasporas can also be a source of savings, which can be channelled as capital inflows to home countries.*

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### *a) Diasporas as a knowledge pool*

The stock of knowledge and skills of emigrants can potentially contribute to the accumulation of human capital and technological capabilities in the home country, mainly through two mechanisms: first, the operation of diaspora knowledge networks, analysed below; and second, the return to the home country of students<sup>17</sup> and long-term emigrants (whose impacts are discussed in subsection C5).

**Diasporas.** A diaspora refers to a community of expatriates who are spread or dispersed around the world, outside their homeland. A distinctive feature of diasporas is the sense of national identity and emotional attachment to the homeland. Diasporas are often heterogeneous groups. The degree of cohesion, shared values and motivations may vary depending on the type of diaspora and their histories. Some diasporas have greater political and national motivation and corresponding willingness to contribute to the homeland. Yet this may cut both ways: some diaspora groups that are affected by internal conflicts, exile or persecution may be reluctant to engage if they perceive governments at home as hostile and unfriendly to them. By contrast, other types of diaspora groups, e.g. those formed by internationally mobile professionals and entrepreneurs, can be willing and prepared to cooperate with their homeland in the transfer of knowledge, as well as capital, networks and other attributes if they see the home conditions as propitious and/or a possible source of commercial gain (Solimano, 2010).

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*A diaspora refers to a community of expatriates who are spread or dispersed around the world, outside their homeland.*

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**Diaspora knowledge networks.** Diasporas can thus serve as “brain banks” abroad; when properly organized, they can become a source of knowledge sharing and technology transfer with their home country (Mahroum et al., 2006). Technology appears to diffuse more efficiently through culturally and nationally linked groups. As shown in chapter 5 of this Report, by facilitating international knowledge flows and technology diffusion, diasporas can act as “knowledge brokers” and promote innovation in the home country (Agrawal et al., 2008, 2011). The skills of diaspora members are deemed especially appropriate, thanks to their combination of technical and substantive expertise with their acquaintance with local conditions (language, institutions, culture, etc.). However, the intensity and quality of knowledge flows and transfer between host and home countries depends on how they are organized, the actors involved, the amount of finance mobilized, the commitment of diaspora members, and the institutional and economic development of the home countries. High-skilled emigrants tend to share little knowledge with home countries if these are small or

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*Diasporas can be willing to cooperate with their homeland in the transfer of knowledge, as well as capital, networks and other attributes.*

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low-income economies which are not undergoing rapid structural transformation. There, information flows tend to concentrate mostly on emigration itself (i.e. work opportunities abroad, migration mechanisms, etc.) (Gibson and McKenzie, 2010). This is in sharp contrast with the case of home economies which are large or growing rapidly and undergoing structural transformation. Successful examples of diaspora knowledge mobilization (e.g. Israel, Taiwan Province of China, India and China, discussed in chapter 5 of this Report) show that diaspora technological entrepreneurs overseas can play an important role in helping to develop technological firms at home and serve as a two-way link for market knowledge, connections and technological transfer across countries.

#### *b) Initiatives to harness diaspora knowledge flows to LDCs*

The channels used to date to foster the transfer and sharing of diaspora knowledge and skills with LDCs home countries can be grouped into two categories: 1. diaspora-inspired initiatives; and 2. multilateral and bilateral programmes.

***Diaspora initiatives.*** While most LDC diaspora associations, organizations and NGOs have philanthropic objectives, some of them are aimed at assisting home countries in benefiting from the expertise, skills and experience accumulated by diaspora members. This is the case with diaspora associations of medical doctors, scientists, engineers, etc., which strive to transfer and share knowledge and technology with researchers, scientists and entrepreneurs in the country of origin. Most LDC diaspora organizations are based in developed countries. Examples of successful knowledge initiatives and programmes are provided in box 9.

***Bilateral and multilateral programmes.*** These include programmes initiated by international organizations (typically acting in collaboration with national governments of both home and host countries) or knowledge components of wider agreements between origin and destination countries initiated to influence bilateral migration and the ensuing flows of expertise and business. The knowledge components of these programmes take the form of either advisory missions or participation in specific projects in the home country. The main beneficiaries in the LDC home countries are universities, government institutions, civil society and the private sector.

At the multilateral level, the United National Development Programme (UNDP) launched the Transfer of Knowledge Through Expatriate Nationals (TOKTEN) in 1977. The International Organization for Migration (IOM) has also been running the Temporary Return of Qualified Nationals (TRQN) and Migration for Development in Africa (MIDA), the latter since 2001. Through MIDA, the following LDCs have created partnerships with destination countries and expatriates: Benin, Burkina Faso, Burundi, the Democratic Republic of the Congo, Ethiopia, Guinea, Mali, Mauritania, Rwanda, Senegal, Sierra Leone and Somalia. Box 10 provides examples of how international programmes operate in LDCs.

Several bilateral programmes have been launched jointly by host and home countries in order to foster cooperation on bilateral migration. They typically deal with different aspects of international labour flows, including diaspora mobilization through knowledge transfer and direct investment, and assistance to permanent return migration. One example is the Programme d'Appui aux Initiatives de Solidarité pour le Développement (PAISD), jointly undertaken by the Governments of Senegal and France during 2009–2011 in the context of co-development programmes. With total funding of €9 million, its knowledge component financed 52 diaspora experts to transfer knowledge and experience to Senegalese counterparts through short- to medium-term missions. The sectors targeted were health, agriculture and food industry, management, ICTs

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*High-skilled emigrants tend to share little knowledge with home countries if these are small or low-income economies which are not undergoing rapid structural transformation.*

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*While most LDC diaspora associations have philanthropic objectives, some of them are aimed at assisting home countries in benefiting from the expertise and skills of diaspora members.*

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*Several bilateral programmes have been launched jointly by host and home countries in order to foster cooperation on bilateral migration.*

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### Box 9. Examples of successful LDC diaspora initiatives for knowledge sharing and transfer

The national case studies prepared for this Report highlight some examples of how diaspora knowledge, skills and resources can be successfully harnessed and transferred to home countries.

**Strengthening PhD education at the University of Addis Ababa.** Given the obvious need for more and better training at the doctorate level in Ethiopia, the country's largest university established several PhD programmes. It realized, however, that in order to reach its objectives it could not rely uniquely on its own resources. Accordingly, it decided to mobilize the knowledge of the national diaspora working in foreign academic institutions. To this end, in 2008 it launched a large-scale programme financed by the Ethiopian Government and the Swedish and French official development aid agencies. The main participants abroad have been Ethiopians active in US and European universities, who in several cases convinced their non-Ethiopian colleagues to take part in the project. Their collaboration with the home country has taken the form of participation in research seminars, book donations, links between laboratories in the universities of Addis Ababa and laboratories abroad, and thesis direction by diaspora members. The programme has had a considerable impact on several departments.

**Decoding the jute genome in Bangladesh.** A Bangladeshi microbiologist and biochemist who studied and worked in the Soviet Union, Germany, United States and Malaysia decoded for the latter country the genome sequencing of its most important plant, rubber. In order to have his country of origin benefit from his knowledge and skills, he later undertook the same type of research for jute. This was done in a joint project with the Global Network of Bangladeshi Biotechnologists (GNOB), the Centre for Chemical Biology, the University of Science (Malaysia) and the University of Hawaii (United States) and a team of Bangladeshi researchers. The discovery facilitates pest control and the manufacturing of better finished industrial products out of jute.

**Upgrading the national health sector in Ethiopia.** The People to People association was established by Ethiopian diaspora members in the late 1990s with the aim of mobilizing diaspora skills for the benefit of the home country. It operates in several countries in North America and Europe and has been active above all in the health sector. Its activities have included participating in medical training in Ethiopia, advocating for diaspora mobilization with international organizations and donor institutions, mobilizing resources abroad for medical programmes in Ethiopia, setting up a telemedicine system in the home country, restructuring university hospitals, organizing an annual conference on health in Ethiopia, awarding a prize for medical best practice, and maintaining a blog for the exchange of medical best practices and discussions. The association collaborates with other diaspora organizations, NGOs active in Ethiopia and international organizations (e.g. the World Bank), the United States National Institute of Health and universities of host countries.

**Mobilizing resources and knowledge transfer to Haiti.** In Canada, the Regroupement des organismes canado-haïtiens pour le développement (ROCADH) is an effort to coalesce many philanthropic organizations working for the advancement of Haitian communities back home. ROCADH brings together some 47 home town associations. It has been active in the fields of education and capacity-building (including in agricultural, animal breeding techniques, commodity processing, medical and tourism service skills). ROCADH has been able to channel substantial funding through the Canadian International Development Agency (CIDA). To be eligible for CIDA funds, ROCADH has to contribute one-third of the value of the project.

**Medical diaspora network for Bangladesh.** Bangladeshi physicians in North America established the Bangladesh Medical Association of North America (BMANA) in 1980. It supports the home country by organizing visits of medical teams to provide training and technology transfer, provision of subsidized/pro bono specialized clinical services, and donation of books, computers and journals to medical colleges and universities in Bangladesh. Its members have been participating in activities of knowledge transfer and training in terms of cutting-edge advances in medical specialities, such as neurology, surgery and infection control.

**Water in Ethiopia.** A programme of collaboration between an American and an Ethiopian university was put in place in 2009 at the initiative of an Ethiopian working as professor in a United States university, with financing from the United States Agency for International Development (USAID) under the African American Universities Partnership. It was successful in leveraging official financing to obtain financing from the American private sector for project activities. It foresees the establishment of a research centre on water in Ethiopia to conduct academic research and participate in the formulation and planning of the country's policies and programmes for water management.

and biotechnology. In some cases, the projects included financing to upgrade installations and equipment of home country beneficiary institutions (both public and private).<sup>18</sup>

*To date, many of the efforts to establish diaspora knowledge networks have not succeeded in creating synergies with other initiatives or ensuring continuity.*

#### c) Effects on LDCs

To date, many of the efforts to establish diaspora knowledge networks and foster knowledge transfer and sharing between diaspora members and home LDC countries have attained their specific and circumscribed goals. However, they have not succeeded in creating synergies with other initiatives or ensuring continuity, both of which are essential for a regular knowledge flow to home countries. As a result, their development impacts have been limited for a number of reasons, such as:

### Box 10. International programmes to foster diaspora knowledge transfer to LDCs

Afghanistan. Since the 1980s, the resurgent periods of civil conflict in Afghanistan have spurred brain drain (over one-third of high-skilled workers lived abroad in 2000), low numbers of permanent return migration and the deterioration of the educational system, which failed to modernize. As part of reconstruction efforts of the 2000s, international organizations mobilized high-skilled diaspora members to contribute through transfer of skill and knowledge, and local capacity-building. From 2002 until 2006, 38 volunteers provided assistance to the national capacity-building efforts of the Afghan Interim Administration and the successor government. They were mobilized through the TOKTEN programme of the UNDP. IOM launched a Temporary Return of Qualified Nationals (TRQN) programme together with the Netherlands. It mobilized and financed the temporary return (for three or six months) of members of the Afghan diaspora in the Netherlands in the fields of education, health, engineering, infrastructure and information technology. Despite some initial resistance, diaspora members were able to teach and train locals in new teaching methods, university organization, medical procedures and equipment, building techniques, use of computers and the Internet, software previously not in use in Afghanistan, and work and managerial methods and routines. These innovations had been learned and/or practised by diaspora members in the host country. Participants mentioned as their motivation identification with the home country and their desire to participate in its rebuilding (Siegel and Kusminder, 2012).

Great Lakes. The MIDA Great Lakes Programme was launched by IOM in 2001 and is expected to continue until 2012. Its main objective was to fill technical skills gaps in the fields of health, education and rural development, by tapping into the knowledge pool of the diasporas of Burundi, Democratic Republic of the Congo and Rwanda in Europe. It started by identifying the technical skills needs of local beneficiary institutions (universities, hospitals, laboratories, professional training centres). To match the demand side, the supply side was organized by mobilizing diaspora experts interested in participating and selecting them. Training and capacity-building activities were undertaken through the return of diaspora members, which could be temporary (ranging from some weeks to several months), virtual (by means of ICTs and e-learning tools) or – exceptionally – permanent. More than 400 short-term expert and capacity-building missions were carried out. The main achievements claimed by the project are training physicians and paramedics; strengthening health institution management and planning; introducing South–North partnerships of health institutions; improving course quality in universities; relaunching courses previously inactive for several years; strengthening libraries and IT infrastructure in education institutions; and building the capacity of ministries and provincial authorities active in rural development. The Programme claims that its actions are aligned with national priorities. It was foreseen that at the end of the project, the functions of diaspora mobilization and matching of skills would be transferred to the three national governments and to diaspora associations.<sup>1</sup>

<sup>1</sup> Based on information available at the website of the project (<http://mida.belgium.iom.int/>).

*Dispersion and lack of coordination of resources.* The spread and multiplication of actors, initiatives and programmes and the lack of coordination among them result in the dispersion of efforts, energy and resources.<sup>19</sup>

Most LDC diaspora associations and NGOs tend to be ad hoc efforts with very small budgets, and their actions are local and small-scale. Often their members, although willing to engage, are not experts in the field of development, which does not allow them to undertake large-scale development projects that could have a region-wide or country-wide impact on the lives of the beneficiaries. In many cases, emigrants rely on channels such as family members, local chieftains or social and professional networks to carry out their activities, depending on the level of institutional development of the home country. At the same time, they often lack more structured institutional support.<sup>20</sup> The lack of coordination can limit the effectiveness of the initiatives and programmes which are implemented by individual or a small number of organizations and NGOs. This can lead to situations in which “projects carried out by such [diaspora] organisations interfere with mainstream policies carried out by the national government or local organizations” (Zoomers and van Naerssen, 2006: 73).

Nevertheless, in some cases, diaspora knowledge-sharing initiatives are undertaken in partnership with home country governments or international organizations. Coordinating the actions and programmes of different actors can leverage existing resources and greatly enhance their development impact (box 9).

Official international initiatives for diaspora knowledge-sharing and transfer through circular migration or return sometimes encounter problems. First, the financial and human resources involved can be somewhat limited. For instance, the final report of a large project aimed at clarifying the links between migration and development and the impact of official programmes for promoting knowledge transfer concludes that “the numbers are very modest and the

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*The multiplication of initiatives and the lack of coordination among them result in the dispersion of resources.*

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*Coordinating the actions and programmes of different actors can leverage existing resources and greatly enhance their development impact.*

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*The number of beneficiaries is not in proportion to the total number of migrants and/or expatriates.*

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success is limited and the number of beneficiaries is not in proportion to the total number of migrants and/or expatriates” (Zoomers and van Naerssen, 2006: 29). Second, such initiatives are frequently inconsistent with national priorities. Knowledge-sharing programmes and activities are often designed without consulting home country governments and are not articulated with broader development strategies or wider national policies and programmes in mind. This thwarts the desired effectiveness of diaspora knowledge initiatives.

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*Trust among different groups of the diaspora and stakeholders of knowledge transfer is often lacking.*

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**Trust.** Trust among different groups of the diaspora and stakeholders of knowledge transfer is often lacking, hampering collaboration and coordination between them. In some cases, associations of LDC nationals living abroad prefer not to undertake projects in collaboration with the national government either because of the causes of emigration (civil conflict, political strife, etc.) or due to frustration with bureaucratic delays and uncertainty concerning the use of funds. In other cases, trust is lacking among diaspora associations themselves.

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*Even if it is easier to learn from fellow countrymen and countrywomen than from foreigners, it still entails costs.*

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**Limited information.** Some LDC governments have initiated programmes and action courses to strengthen the engagement of their diasporas with the home country (e.g. Bangladesh, Senegal, Mali, Rwanda, Ethiopia and Haiti). One of the components of these programmes is collecting information on diasporas, including their number, location, professional activities, skills, etc. Information gathering is the first step towards strengthening the engagement of the diaspora in the development of the home country. However, those LDCs which have not initiated an active programme of diaspora engagement are typically not aware of the potential that diasporas represent in terms of skills and knowledge (but also in terms of savings and investment potential). This lack of information prevents them from mobilizing diaspora knowledge effectively.

**Differential treatment of nationals.** In order to attract diaspora members to work for the home country (temporarily or permanently), national governments and international organizations often mobilize financial resources for and/or provide special treatment to these emigrants (e.g. fiscal breaks, special political rights). Such treatment can generate resentment among national residents working at a comparable grade (e.g. government officials, experts, professors, scientists, researchers), hampering collaboration between national residents and diaspora members.

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*Diasporas can contribute to the development of their home country by facilitating the establishment of business and trade networks between the home and the host country.*

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**Cost of technology transfer.** The transfer of knowledge, skills and technologies requires efforts by beneficiaries and transferors. It therefore entails costs of local adaptation of procedures, methods and equipment, including the creation of locally appropriate skills and resources. This feature is well known from the literature on transfer of technology (Teece, 1977; von Hippel, 1994). Even if it is easier to learn from fellow countrymen and countrywomen than from foreigners, it still entails costs (Obukhova, 2009). Such costs tend to be overlooked when planning diaspora knowledge transfer programmes and initiatives.

## 4. DIASPORA BUSINESS NETWORKS

### a) Potential business impacts of diasporas

Apart from forming diaspora knowledge networks, diasporas can contribute to the development of their home country by facilitating the establishment of business and trade networks between the home and the host country. Diaspora members can help link people and firms in both countries thanks to superior knowledge of, or preferential access to, market opportunities, as well as familiarity with home country markets, language, preferences and business contacts. Emigrants can also help overcome reputational problems their home

country may have abroad. Diaspora members reduce transaction costs by means of these specific skills and capabilities.

Diasporas can play an important role in fostering business creation and expansion in the home country by participating in external searches for new market opportunities and domestic institutional reform, through their contacts with domestic officials concerning the redesign of relevant institutions and firms. Diasporas have played a major role in the establishment and development of high-tech clusters in India, China, Taiwan Province of China, Israel and Ireland since the 1990s (Saxenian and Sabel, 2008; Saxenian, 2005), as discussed in greater detail in Chapter 5 of this Report.

Business linkages and economic flows between home and host countries can come from either high-skilled or low-skilled emigrants, but they are more likely in the case of high-skilled emigrants, since the latter tend to have wider and higher-level contacts in both home and host countries (Docquier and Lodigiani, 2010).

The presence of a diaspora is therefore often associated with higher bilateral trade flows (Gould, 1994; Mesnard and Ravallion, 2001; Head and Ries, 1998; Rauch and Trindade, 2002; Rauch and Casella, 2003; Combes et al., 2005; Peri and Requena, 2009). The most direct and simple form of a diaspora business network is when the diaspora itself is a prime market for the exports of home country goods, in what has been termed “ethnic trade” or “nostalgia trade”. This consists mainly of foodstuffs, but also includes films and music, reading material, utensils and dishes, ornaments, textiles and clothing – goods which, in principle, have more difficulty penetrating international markets than other types of exports (Newland and Taylor, 2010). If home country exporters are successful in exploiting the diaspora market, they can move beyond it to tap other markets. In this case, diasporas serve as a bridge to wider markets.

Beyond merchandise trade, the presence of diasporas also stimulates the export of services, especially international tourism. Diaspora tourism offers domestic agents some advantages over other types of tourism. First, diaspora tourist spending typically reaches domestic goods and services suppliers more directly, as nationals tend to use locally-targeted accommodation, shops and restaurants rather than facilities established for typical international tourists. As a result, this type of spending reduces the well-known phenomenon of tourism leakage (Supradist, 2004). Second, diaspora tourists are more widely spread over the home country territory. Third, their arrivals can be less seasonal than those of other tourists (Newland and Taylor, 2010). Diaspora tourism is therefore likely to have a greater developmental impact than other types of tourism. Moreover, diasporas can serve as a bridge to wider markets by overcoming reputational problems or a lack of information in host countries concerning their home country as a tourist destination, as with the case of nostalgia trade. In most of the countries sampled by Gibson and McKenzie (2010), more than half of high-skilled emigrants advised other people concerning tourism in their home country.

Another, non-exclusive possibility of diaspora business networks is for diaspora members to invest directly in the home economy (Javorcik et al., 2001; Kugler and Rapoport, 2007; Docquier and Lodigiani, 2010). This may take various forms, such as a capital contribution to family business, the acquisition of shares in publicly traded firms, or other forms of direct diaspora investment. Evidence presented by Gibson and McKenzie (2010) shows that this is the exception. Only between five and eight per cent of high-skilled migrants from developing countries invested directly in their home country, and the amounts invested were relatively small (less than \$18,000).

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*Emigrants can help overcome reputational problems their home country may have abroad.*

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*The presence of a diaspora is often associated with higher bilateral trade flows.*

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*The most direct form of a diaspora business network is when the diaspora itself is a prime market for the exports of home country goods.*

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*If home country exporters are successful in exploiting the diaspora market, they can move beyond it to tap other markets.*

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*Diaspora tourism is likely to have a greater developmental impact than other types of tourism.*

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### *b) Initiatives to strengthen diaspora business effects*

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*In order to engage diasporas and encourage them to invest part of their savings in LDC home countries, action has been taken at the international, bilateral and national levels.*

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In order to engage diasporas and encourage them to invest part of their savings in LDC home countries, action has been taken at the international, bilateral and national levels. Programmes have targeted both individual and collective investment. LDCs like Burundi, Democratic Republic of the Congo, Ethiopia, Senegal and Rwanda have launched initiatives to attract direct investment of their diasporas by organizing roadshows for investor; publishing investment guides geared to their diasporas; encouraging diaspora investors' associations; initiating dialogues on major constraints for emigrant investment in the home country, including diaspora investment in bilateral cooperation programmes, etc.

At the multilateral level, some Migration for Development in Africa (MIDA) projects carried out by IOM feature a component aimed at strengthening diaspora investment in the home country and mobilizing diaspora business and professional networks in order to strengthen international business activity of home countries. This comes in addition to the MIDA components designed to foster knowledge flows to home countries.

At the bilateral level, several agreements launched in conjunction with European co-development initiatives have incorporated a component to foster diaspora investment in the home country. In some cases, programmes foresee co-financing of development projects by diasporas and donor countries. In 2009, Senegal launched the Plateforme d'appui au Secteur Privé et à la Valorisation de la Diaspora Sénégalaise en Italie (PLASEPRI) together with Italy, and another programme, Programme d'Appui aux Initiatives de Solidarité pour le Développement (PAISD), together with France. These three-year programmes aim to boost SME development and employment generation in regions with high emigration rates.

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*There is a very high participation of migrants in the United States in the market for home-country goods.*

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Among national initiatives, in 2009, Senegal launched the Fonds d'Appui aux Investissements des Sénégalais de l'Extérieur (FAISE), aimed at encouraging diaspora members to invest in their region of origin.

### *c) Diaspora business effects in LDCs*

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*Diasporas represents a major export market allowing the diversification of home country exports.*

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There is a very high participation of migrants in the United States in the market for home-country goods, according to Orozco (2008). Each migrant spends almost \$1000 per year on nostalgia products, and the total may exceed \$20 billion annually. Orozco and Burgess (2011) estimate that some 90 per cent of Haitians living in the United States consume nostalgia goods to the tune of \$800 per person per year, which amounts to a potential market of some \$285 million. For the home country, this represents a major export market allowing the diversification of its exports. While 80 per cent of Haitian exports consist of manufactures, nostalgia goods are mostly agriculture-based. Similarly, Debass and Orozco (2008) estimate that the Ethiopian diaspora in the United States spends \$1,077 on nostalgia goods annually. Going beyond diaspora markets, in the United Kingdom, part of the Ethiopian diaspora has established a niche market by marketing home coffee to independent delicatessens, ethically aware food shops, corporate purchasers and faith groups through the Oromo Coffee company (Newland and Taylor, 2010).

Econometric evidence computed by the UNCTAD secretariat indicates that worldwide, the presence of both skilled and unskilled immigrants helps to expand merchandise trade between home and host countries. The former have a trade-creating impact which is double that of the latter. In the case of the LDCs, by contrast, unskilled immigrants have such an impact, but there is little corresponding evidence in the case of skilled immigrants. This indicates that so

far, low-skilled LDC immigrants have been more involved in facilitating bilateral trade in their destination countries than their more educated fellow countrymen and countrywomen.

With regard to tourism, 70 per cent of the 254,000 tourists arriving in Haiti are Haitian-born or of Haitian origin, with the United States, Canada, France and the Dominican Republic as the leading sources (data for 2011). These are the main host countries of the Haitian diaspora. Haitian diaspora tourists spend amounts ranging from \$1000-5000 per person on each trip, and it is therefore likely that they account for a larger share of the country's tourism receipts than the number of tourists arriving in the country.

The diaspora business network effect of generating bilateral FDI is expected to vary according to the size of the diaspora and of the home country (Docquier and Lodigiani, 2010). FDI by diasporas in LDC home countries (which are mostly small economies) is still limited. According to concerns expressed by potential LDC diaspora investors, the main reported deterrents are lack of support from the home government, a dearth of incentives for investment, and diasporas' demand for guarantees for their investments. Still, some LDC diasporas have started gearing up to invest in their home country. Members of the Haiti diaspora are active in FDI in the areas of mining, tourism, energy and financial services. They seem to be cautious and risk-averse, typically taking minority stakes in projects and companies and shunning larger investment projects. The diasporas of Rwanda and Liberia have launched or planned diaspora funds, which are professionally managed vehicles that allow individual investors to diversify risk by purchasing shares of a basket of investment products – typically including money market funds, sovereign and corporate bonds, and equities (Terrazas, 2010).

In Senegal, PAISD provided technical assistance for 221 investment projects in the country in agriculture, domestic trade, handicraft, services, tourism, ICT, consultancy, etc. Half of them were undertaken by diaspora members who remained in France, while the others were implemented by investors who returned permanently to Senegal to oversee their projects. The total value of the beneficiary investment projects was \$4 million, which represents around 0.1% of gross fixed capital formation in 2010. Some \$400 million were mobilized to co-finance them.<sup>21</sup> PLASEPRI had a budget of €24 million, consisting mainly of credits to SMEs and microfinance institutions as well as a grant component. Also in Senegal, in 2010 FAISE had a budget of \$323,000 to finance 31 diaspora projects, mainly in fisheries, small industry and services (ANSD, 2011).

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*So far, low-skilled LDC immigrants have been more involved in facilitating bilateral trade in their destination countries than their more educated fellow countrymen and countrywomen.*

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*Seventy per cent of the tourists arriving in Haiti are Haitian-born or of Haitian origin.*

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*Some LDC diasporas have started gearing up to invest in their home country.*

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## 5. RETURNEES

### *a) Potential contribution to the home country*

The potential contributions of permanent returnees to the home country are many and often depend on the level of development of the home country and the range of opportunities for the involvement of returnees. Some of the potential contributions are discussed below.

**Knowledge.** Returnees can deploy their skills and experience accumulated abroad by working in knowledge-intensive activities, e.g. government, consultancies, managerial positions in firms, etc. (Dustmann and Kirchkamp 2002). They can also forge and sustain simultaneous and multi-stranded relationships that link their societies of origin and destination (Glick Schiller et al., 1992). There is ample evidence demonstrating that the knowledge and skills accumulated abroad and brought home by returnees have significantly boosted

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*The potential contributions of permanent returnees to the home country are many and often depend on the level of development of the home country.*

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the technological capability and innovation activities of economies that have successfully undergone structural change, as shown in chapter 5 of this Report.

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*Returnees are more likely to be entrepreneurs than their fellow countrymen and countrywomen who did not emigrate.*

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**Entrepreneurship.** Returnees can use their entrepreneurial capabilities to establish new businesses,<sup>22</sup> which may be in technologically more advanced sectors. Compared with their fellow countrymen and countrywomen who did not emigrate, returnees are more likely to be entrepreneurs thanks to:

- Savings accumulated during emigration;
- Additional skills acquired abroad (McCormick and Wahba, 2001; Wahba and Zenou, 2011);
- Connections to business networks established while living abroad, which can be mobilized for the purposes of foreign trade, marketing, financing, access to technology, etc.

Entrepreneurial activities of returnees can arise from both high-skilled and low-skilled emigration, but are more likely to have an impact in the former case. High-skilled emigrants are more likely to have acquired managerial experience abroad and to have put aside savings necessary to start businesses.

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*Returnees can participate in institution-building in the home country by strengthening both supply of and demand for institutions.*

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**Institutions.** Returnees can participate in institution-building in the home country by strengthening both supply of and demand for institutions (Docquier, Ldogiani et al., 2011; Easterly and Nyarko 2009). This is a mirror effect of the loss incurred by the home country due to brain drain (see section B3f above), with the major difference that returnee actions are enriched by their learning and experience abroad.

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*Sustained growth over many years tends to precede permanent return, especially for high-skilled migrants.*

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However, the various potential positive contributions of permanent returnees to the home country mentioned above are not always realized. This depends on the conditions of return, in particular returnees' motivation, preparedness and time spent abroad (Cassarino, 2004), as well as local conditions. Typically, home economies that are not undergoing structural transformation are less likely to attract returnees who want to participate actively in local development. By contrast, highly dynamic home economies stand a greater chance of luring migrants back. Sustained growth over many years tends to precede permanent return, especially for high-skilled migrants. This has been the experience of Republic of Korea and Taiwan Province of China. It means that permanent return of the high-skilled is more often a consequence than a trigger of economic growth (Docquier, 2006).

### *b) The experience of LDCs*

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*The conditions of LDCs have generally not been very conducive to active contributions by permanent returnees to home country development.*

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The conditions of LDCs have generally not been very conducive to active contributions by permanent returnees to home country development. The major driver is family reasons, but other motivations seem to vary according to conditions prevailing locally in LDCs. In Haiti, these include above all involuntary return (e.g. deportation, work permit expiry, failure to find a job, etc.). In Senegal, Uganda and Burkina Faso, the fact that emigrants had no intention of staying abroad is the second most important reason quoted for return. By contrast, Bangladeshi returnees interviewed for this Report cited positive motivations besides family reasons, such as the desire to have a greater impact on society and willingness to make own knowledge and experience available to the home country.

Most LDCs have only been able to attract return migration in very low numbers, a factor which has constrained their contribution to home country development. The rate of return (i.e. the number of returnees as a share of the emigrant stock plus returnees) in a selection of LDCs varies from six per cent in Uganda to 10 per cent in Senegal and approximately 15 per cent in Haiti and

Burkina Faso. As a share of the population, they account for less than two per cent in all four cases.<sup>23</sup> It should be borne in mind that in these countries (except for Uganda) the vast majority of returnees are low-skilled, which means that they are less likely to have accumulated resources and new knowledge abroad. As for the time spent abroad, in Haiti, out of returned emigrants 78.4 per cent have lived six years or less abroad. Only 6.7 per cent of all returnees have spent ten years or more abroad, which means that most returnees have had little time to accumulate resources.

On the whole, professional and business development opportunities have not been very common in most LDCs, so they have not been very successful in attracting returnees and benefiting from their professional and entrepreneurial activities. In many cases, LDC returnees have tried to start new businesses, but have been discouraged by lack of support for enterprise development (extension services, financing, etc.) or have found bureaucratic requirements too demanding. This contrasts with the experience of more vibrant economies which offer wider opportunities for returnees in terms of both economic activities and professional prospects, as exemplified by Bangladesh (box 11).

Despite these caveats, there is evidence of positive effects for migration and returnees' activities in the home country and for returnees' contribution to economic activities in LDCs. In Senegal, research findings show that returnees

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*Professional and business development opportunities have not been very common in most LDCs.*

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#### Box 11. Contributions of returnees to the Bangladeshi economy and society

The highly skilled knowledge workers who migrated from Bangladesh through State-sponsored scholarships from the 1950s to the 1980s rarely returned or circulated to the home country. Since the 1990s, however, private universities, technical institutions, research bodies and NGOs have provided a launching pad for temporary or permanent return. At present, the country has reached a social and economic stage where the return and circulation of knowledge workers are sustainable (RMMRU-DRC, 2005). Some examples of the contribution of permanent returnees to Bangladesh in different domains are given below.<sup>1</sup>

**Education.** After studying and working at Harvard University (United States), a scientist returned to Bangladesh, where he is contributing to the development of a leading private university. He has successfully developed collaborative research relationship with different United States and United Kingdom universities, including for an international centre for climate change and development in his institution. After having studied and worked in the United States, a computer scientist returned to Bangladesh to become a professor of computer science and engineering at a public university. He is a public activist and part of the nationwide campaign using contests and science fairs, for example, to encourage young students to concentrate on science and mathematics. He has been a member of the technical committee which prepared the draft national education policy.

**Medicine.** After working as a senior physician in a leading US hospital, a Bangladeshi doctor returned to his home country to use his expertise in pathology and improve the quality of pathology tests. There are only a few individuals in the country with exposure to leading-edge pathology, which is one of the most technology-intensive branches of medicine. Some Bangladeshi doctors, after finishing their post-graduate studies in Japan, returned to their home country, where they established the Japan Bangladesh Friendship Hospital (JBFH) in 1993 in partnership with Japanese doctors. The Hospital has initiated a grassroots programme entitled "Krishoker Sashtho Seba" (health care for farmers). It has been conducted in the remote areas of Bangladesh in order to provide health-care facilities to farmers since 2006. JBFH also provides health-care facilities to the marginal and underprivileged and organizes workshops on issues such as first aid training and awareness of common diseases.

**Telecommunications.** A top Bangladeshi manager studied in the United States, where he worked in both the public and private sectors. He returned to his home country, where he contributed to providing access to telephone services and increasing self-employment opportunities for the rural poor through connectivity. In 1993, he started a company with the backing of a Norwegian telecom company and financing from aid agencies and development banks. The company later became a major telephone operator, with 16 million subscribers providing telephone access to more than 100 million people covering 60,000 villages.

**Finance.** A Bangladeshi returnee from the United States and one from the United Kingdom have successfully contributed to the strong spread of microcredit in Bangladesh, first to the country's subsistence farmers then to urban areas. Rahman (2010) argues that this helped foster entrepreneurship among the rural poor.

**Media.** Two communications professionals developed international careers as journalists and worked for several public affairs and media bodies in Asia, North America and Europe, including international organizations. They later returned to Bangladesh, where they launched a newspaper in 1991, with the stated aim of strengthening democracy and freedom of expression. The newspaper has become the country's English-language daily with the largest circulation.

1 The individual cases presented in this Box as examples derive from a country study prepared for this Report.

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*In Senegal, returnees have some characteristics which differentiate them favourably from non-migrants.*

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have some characteristics which differentiate them favourably from non-migrants: 1. returnees have higher labour force participation rates and have a stronger tendency to be self-employed; 2. they are more likely to have skilled jobs; 3. they are more present in commercial and handicraft activities; 4. they have higher earnings (Mezger, 2008; Mezger and Flahaux, 2010). Beyond self-selection at the moment of deciding whether to migrate or not, it is likely that the knowledge and experience accumulated abroad contribute to further differentiating returnees from non-migrants.

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*In Senegal and Burkina Faso, returnees have invested mainly in traditional sectors.*

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Survey evidence on the investment activity of returnees in LDCs shows that in Burkina Faso, 32.5 per cent of them have invested based on the savings accumulated abroad, whereas in Senegal the corresponding share is 17.3 per cent.<sup>24</sup> In the former country, all individual returnee amounts invested were smaller than \$5,000, while in Senegal they ranged as high as \$20,000. The total cumulative amount invested by returnees in Senegal corresponds to 2.6 per cent of the country's gross fixed capital formation in 2009, whereas in Burkina Faso, the corresponding share is a higher 6.2 per cent.<sup>25</sup> In both countries, returnees have invested mainly in traditional sectors. In Burkina Faso, the primary sector accounted for 65 per cent of returnee investment projects, whereas in Senegal, 60 per cent of the projects were in trade and services, while the remainder was in the primary sector and real estate. A fraction of returnee investment involved international partners: two per cent or less in both cases. It is likely that a significant share of these business partnerships resulted from contacts held while living abroad, possibly indicating some form of diaspora business network.

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*Given a conducive domestic environment and policy action, the potential of returnees and their entrepreneurship can be developed to a much greater extent.*

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These case studies do not correspond to the typical examples of transformative returnee entrepreneurship in modern sectors which assists the structural transformation of home country economies, as was the case with a few successful dynamic developing countries mentioned above. Still, they do show that the potential of returnees and their entrepreneurship is far from negligible. The example of the contribution of Bangladeshi returnees (box 7) reveals that, given a conducive domestic environment and policy action, this potential can be developed to a much greater extent.

### *c) International programmes to assist permanent return*

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*The emphasis of international programmes has mostly shifted to temporary return, i.e. from return migration to circular migration.*

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International action has striven to assist return migration by facilitating their permanent resettlement in the home country and providing financial assistance in that respect. This was the case for the Return and Reintegration of Qualified Nationals (RQN) programmes of the International Organization for Migration (IOM) and the Transfer of Knowledge Through Expatriate Nationals (TOKTEN) programme of the United Nations Development Programme (UNDP), mentioned above. However, these programmes have generally failed to meet expectations. They have been very costly, considering the amounts allocated to individual returnees. At the same time, the financing required to effectively help returnees resettle in their home country has been much higher than what is available through the programmes. In several cases, beneficiary nationals returned to the home country temporarily but subsequently emigrated again.<sup>26</sup> Therefore, the emphasis of international programmes has mostly shifted to temporary return, i.e. from return migration to circular migration. TOKTEN was mainly reoriented towards temporary return. IOM has launched the *Temporary Return of Qualified Nationals (TRQN)* and *Migration for Development in Africa (MIDA)* focusing on temporary return to replace previous programmes aimed at permanent return (see section C3b above).<sup>27</sup> In bilateral initiatives, by contrast, assistance to permanent return remains one of the components, as in the case of the bilateral programmes and agreements on co-development to which European countries are a party.

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## D. Conclusions

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According to Gibson and McKenzie (2011: 125), “we are still some way from a comprehensive global answer on the effect of brain drain on sending country growth and development outcomes”. This is certainly true of LDCs. Nevertheless, this chapter has presented analysis and information which help us to identify some major features of high-skilled migration and the potential impact of diasporas on LDC home country development.

On average, LDCs are more affected by brain drain than any other group of countries. The intensity is especially acute in islands (where more than half of the high-skilled workers often live abroad) and in African LDCs, 21 of which have more than one-fifth of their high-skilled population abroad. The brain drain rate is lower in Asian LDCs, though even there it is still higher than in other developing countries. There is strong variation in the rates of brain drain of LDCs, but it is close to the estimated “optimal” level (5–10 per cent) in only five of these countries. Apart from the likely adverse macroeconomic effects to be expected at these high rates of brain drain, emigration of highly qualified LDC nationals has adverse consequences, especially in the activities of health, education and STI. This brain drain primarily amounts to a South–North transfer of resources.

Available evidence shows that the (positive) developmental impacts of brain drain on LDCs have been limited so far. Concerning their human capital base, since the 1990s, education enrolment in most LDCs has been expanding rapidly at all levels, including the tertiary stage. This expansion is driven mainly by public policies and by the increased supply of educational services. It is very difficult to attribute improving educational attainment (or a significant share of it) to the incentive effect of emigration, although some observers argue that it has been one of the factors pushing demand for higher education.

There are indications of embryonic diaspora business network effects in a few LDCs. With respect to financial and capital flows, beyond the remittances analysed in chapter 3 of this Report, a few LDCs have taken initial steps to mobilize the savings of their diaspora through diaspora bonds and FDI. Some fledgling diaspora business network effects are starting to appear in terms of strengthening trade and investment ties between home and host countries. The current impact pertains especially to bilateral trade in services (especially tourism) and goods (e.g. nostalgia trade). LDC diaspora FDI in home countries is still very limited compared to its potential.

Diaspora knowledge networks are incipient in most LDCs. A number of initiatives and programmes to leverage diaspora knowledge for the benefit of LDC home country development have been launched. They are undertaken by individuals, diaspora associations and NGOs, national home and host country governments and/or international organizations, often in an uncoordinated way. They generally have positive effects, but these are very localized and specific. In most cases, these initiatives do not have a broader impact because the multitude of actions by different stakeholders tends to dilute resources, efforts and energies. They are often isolated programmes, which are not linked to broader development strategies and policies. The few cases of more effective initiatives have typically been a result of coordinated action by different stakeholders — including the home government —, which creates synergies among agents and leverages resources.

Returnees’ contribution to investment, innovation and institution-building in LDCs has varied according to local conditions in home countries. Where local conditions are unfavourable to investment and innovation and/or policy has

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*We are still some way from a comprehensive global answer on the effect of brain drain on sending country growth and development outcomes.*

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*The (positive) developmental impacts of brain drain on LDCs have been limited so far.*

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*Some fledgling diaspora business network effects are starting to appear.*

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*The few cases of more effective diaspora mobilization initiatives have typically been a result of coordinated action by different stakeholders, which creates synergies among agents and leverages resources.*

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*The contribution of diasporas and other positive effects of brain circulation to the development of LDCs is below its potential.*

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*Initiatives can be taken to strengthen the home country benefits associated with brain drain. This will require policy action by LDC themselves and by the international community.*

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not been supportive, returnee investment has been limited and has tended to reinforce existing patterns of specialization. By contrast, in some larger LDC economies or those that are growing and undergoing structural transformation, returnees have made significant contributions to economic activity and social innovation.

The contribution of diasporas and other positive effects of brain circulation to the development of LDCs is below its potential. There are two main reasons for this: the development stage of LDCs themselves, and the initiatives put in place. First, prevailing conditions in most LDCs are quite different from those in countries which benefitted greatly from diaspora knowledge and business networks and were able to attract return emigrants. In the latter case, diaporas contributed significantly to home country development, helping many of these countries to become high-income countries.

Second, although most LDCs at present reap limited gains from their diasporas, it is likely that the positive effects of brain circulation will strengthen later during the economic development of these countries. While this is a long-term perspective, initiatives can be taken in the short term to strengthen the home country benefits associated with brain drain. This will require policy action by LDC themselves and by the international community. The next chapter of this Report provides an analysis of policy alternatives and options needed to achieve this objective.

## Notes

- 1 This chapter builds on UNCTAD (2007: 139–160) by updating the statistical information and broadening the scope of analysis and policy recommendations.
- 2 By contrast, low-skilled migrants are those whose highest educational attainment is at the secondary or primary level or who did not undergo any formal schooling.
- 3 Bhagwati and Hanson (2009); Docquier and Rapoport (2012); Kapur and McHale (2005); IOM (2008); Solimano (2010); Pritchett (2006).
- 4 The most widely used database on worldwide brain drain is that of Docquier and Marfouk (2006), which was later revised to provide a gender breakdown (Docquier, Lowell and Marfouk, 2009). It was subsequently expanded in Docquier et al. (2011), which includes non-OECD host countries and therefore captures South–South flows. The first version of this database was kindly made available to the UNCTAD secretariat by its authors.
- 5 High-skilled people flows are in sharp contrast with those of overall migration, where South–South movements predominate, as seen in chapter 2 of this Report. The latter are strongly influenced by the migration of low-skilled people.
- 6 Given the preponderance of oil exporters among developing host countries, developments in the price of this commodity are also likely to play a role in determining brain drain trends in the future.
- 7 The indicators include the number of LDC students, since studying abroad is often the first step towards long-term emigration.
- 8 Even if education is financed privately, this is an investment in human capital formation made under the expectation that it will bring returns.
- 9 These costs are net of: 1. the estimated fiscal gains from domestic consumption funded by remittances; and 2. the Government savings from not having to provide services to people who no longer live in the home country.
- 10 By the same token, host countries become better endowed with skills or human capital, which tends to reinforce their specialization in the corresponding goods and services.
- 11 On the importance of institutions to economic growth and development, see Szirmai (2012) and Bluhm and Szirmai (2012).
- 12 Mountford (1997); Stark (2004); Stark et al. (1997, 1998); Vidal (1998); Beine et al. (2001); Docquier and Rapoport (2007, 2012); Kangasniemi et al. (2007); Commander et al. (2004).
- 13 Angola, Bangladesh, Benin, Burundi, Cambodia, Comoros, Djibouti, Eritrea, Ethiopia, Lao People's Democratic Republic, Lesotho, Madagascar, Malawi, Niger, Uganda and United Republic of Tanzania (UNCTAD secretariat estimates, based on data from the UNESCO Institute for Statistics: <http://www.uis.unesco.org>, accessed on 22/06/2012).
- 14 In Ethiopia, for example, in the mid-1990s, university-level institutions hosted only 15,000 students, but received 300,000 applications annually. However, the introduction of new policies by the Government to boost investment in human capital formation resulted in a rapid expansion of the number of universities and students. During the academic year 2006/2007, universities hosted 203,000 students at the bachelor's level and within five years the number of enrolments had more than doubled to 448,000. Similarly, in Senegal, the number of students enrolled in tertiary-level education institutions swelled from 30,000 in 2001 to 86,000 in 2008, as the expansion rate was double that of the preceding decade. By 2012, total enrolment had reached 91,000.
- 15 Similarly, in Gibson and McKenzie's (2010) survey data for high-skilled emigration from Tonga, Federated States of Micronesia, Papua New Guinea, Ghana and New Zealand, the migration incentive generally pushed respondents to learn a language or take test preparation classes, but not to lengthen schooling itself.
- 16 Even considering that high-skilled emigrants tend to remit more than low-skilled emigrants (and remittance data refer to all migrants), remittances as a share of GDP per capita exceed 20 per cent in only four LDCs: Lesotho, Haiti, Samoa and Nepal.
- 17 Rogers (2004) finds that countries with relatively high numbers of students studying science and engineering abroad experience faster subsequent growth.
- 18 Source: <http://www.codev.gouv.sn>.
- 19 The Government of Senegal, for instance, has recorded as many as 741 associations of the Senegalese diaspora (ANSD, 2011).

- 20 The lack of linkages to national government sometimes stems from limited trust of diaspora organizations in the latter or from missing interest or institutional capacity of the national government to engage with diaspora organizations active in specific projects.
- 21 This share provides an order of magnitude, since the diaspora investment was made over several years.
- 22 A survey of Turkish returnees shows that more than half are economically active upon return and most of them engage in entrepreneurial activities (Dustmann and Kirchkamp 2002). In Egypt, returning migrants tend to have higher levels of human capital than non-migrants, and are likely to be more entrepreneurial the longer they have worked abroad (McCormick and Wahba 2001; Wahba 2007).
- 23 Data for 2009 for Uganda, Senegal and Burkina Faso, and for 2001 in the case of Haiti.
- 24 Based on the same source as table 17.
- 25 These shares provide an order of magnitude, since the returnee investment was made over several years.
- 26 In Ethiopia, out of 30 expatriates who participated in a TOKTEN programme in the home country, only one decided to resettle there permanently (Adredo, 2002).
- 27 In the MIDA Great Lakes Programme (box 10), just 15 permanent returnees were aided financially, as compared with more than 400 missions, often involving more than one expert.