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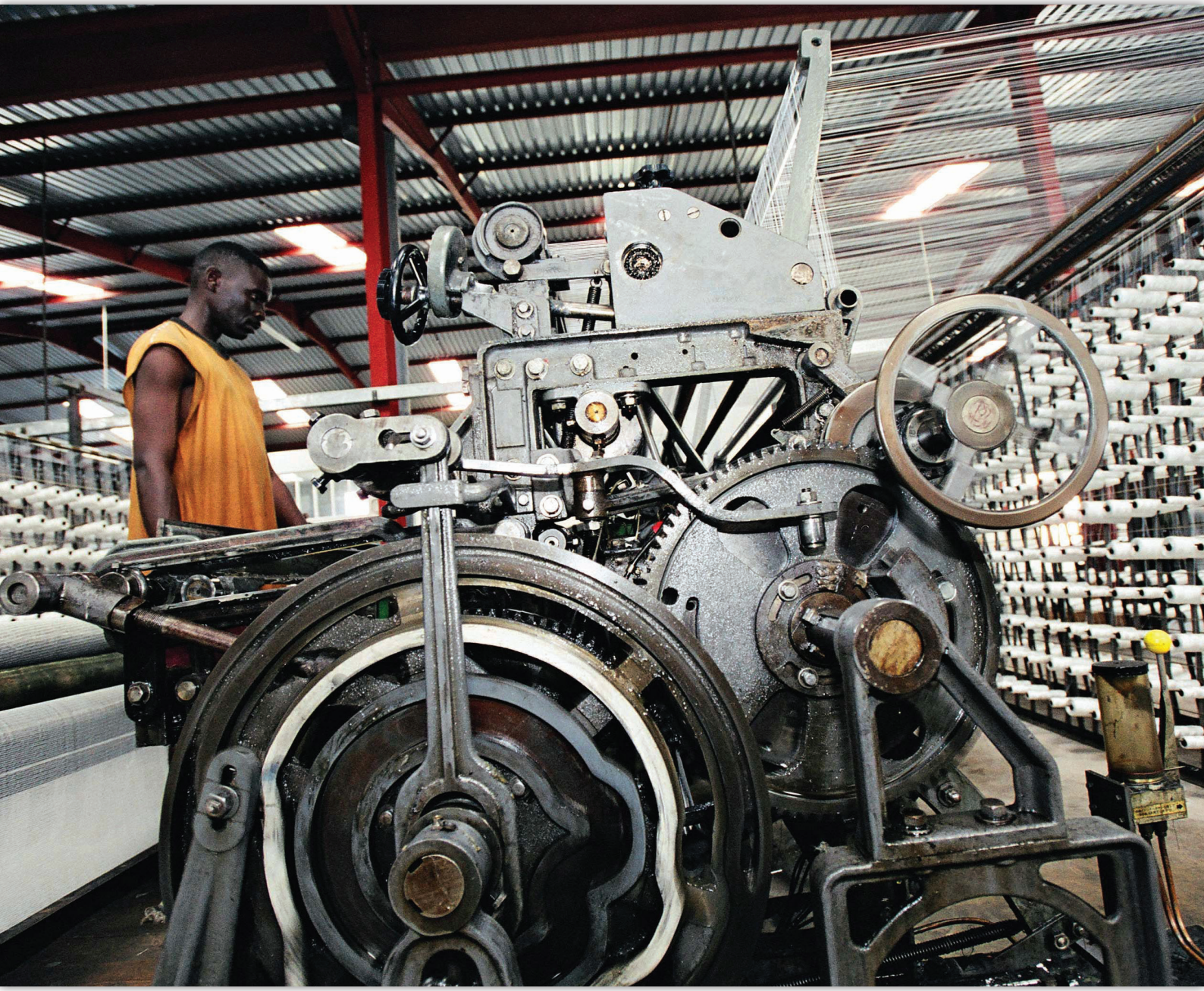
Benchmarking productive capacities in **least developed countries**



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Benchmarking Productive Capacities in Least Developed Countries

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Executive summary

At the thirteenth session of the United Nations Conference on Trade and Development (UNCTAD XIII), which took place in Doha, Qatar, in April 2012, member States requested UNCTAD to develop quantifiable indicators with a view to providing "an operational methodology and policy guidelines on how to mainstream productive capacities in national development policies and strategies in LDCs" (Doha Mandate, para. 65(e)).

The present report, which is part of ongoing work by the secretariat and a response to the above-mentioned request, focuses on measuring and benchmarking productive capacities in least developed countries (LDCs): their current levels; how LDCs have performed in the recent past; and how the productive capacities in LDCs compare with the internationally agreed goals and targets and with other developing countries. It is found that LDCs generally lag behind other developing countries with respect to most indicators, although there is considerable heterogeneity in both groups of countries. The overall impression of the LDC group as a whole is that the development of productive capacities in these countries is advancing, but that the progress is slow and that the challenge of meeting the objectives of the Istanbul Programme of Action (IPoA) by 2020 is daunting.

Although specific policy recommendations must be done on a case-by-case basis, general themes that recur in LDCs include the need to improve data collection and data management, to build national statistical and database management capacities, to continually undertake reforms and to support and promote additional investment in and financing of productive capacities. The development partners of LDCs have important roles to play, including by rebalancing the sectoral distribution of official development assistance (ODA), by improving market access and by channelling resources from the Aid for Trade initiative to augment productive and supply capacities of LDCs.

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Abbreviations

CPIA	country policy and institutional assessment
GDP	gross domestic product
GFCF	gross fixed capital formation
GNI	gross national income
GSP	Generalized System of Preferences
ICT	information and communications technology
IPoA	Istanbul Programme of Action
LDC	least developed country
ODA	official development assistance
OECD	Organization for Economic Cooperation and Development
PCI	productive capacities index
SMEs	small and medium-sized enterprises
STI	science, technology and innovation
TPES	total primary energy supply
UNCTAD	United Nations Conference on Trade and Development
UN-OHRLLS	United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States
WTO	World Trade Organization

I. Introduction

When the least developed country (LDC) category was created in 1971, the General Assembly of the United Nations formally endorsed an original list comprising 25 countries. The newly created group soon expanded and in the 40-odd years that followed saw a net increase of 24 countries. Thus, when South Sudan was added to the list in 2012, the total number of LDCs was brought to the current 49 countries. The expansion of the LDC list over the past four decades can in part be attributed to some countries gaining independence during the period, but in other cases it has been due to the socioeconomic conditions of some countries deteriorating to such an extent that they have been found eligible for inclusion. Meanwhile, there have only been three instances of the opposite scenario, that is, of countries that have managed to graduate from their LDC status and hence be removed from the list. The four ex-LDCs to date are Botswana, Cabo Verde Maldives, and Samoa.

The ambition of LDCs and their international development partners is to reverse the trend of a growing LDC category and enable half of them to graduate by 2020. As in the preceding decades, they adopted a programme of action, the Programme of Action for the Least Developed Countries for the Decade 2011–2020 (Istanbul Programme of Action (IPoA)), which sets out a host of concrete goals and targets across eight priority areas. These serve as the means to the proclaimed overarching end: "to overcome the structural challenges faced by the least developed countries in order to eradicate poverty, achieve internationally agreed development goals and enable graduation from the least developed country category" (para. 27).

One of the priority areas identified in the IPoA is productive capacities, which are regarded as an indispensable element for LDC development. LDC economies may well expand due to windfall gains from natural resource discoveries, tariff preferences or other income sources that are only weakly related to any actual competitiveness. Yet for LDCs to overcome supply constraints and spur structural transformation, boosting their productive capacities is a sine qua non. It is only by improving their infrastructure; energy production; science, technology and innovation; and private sector development that they may be able to follow a path towards long-term growth that is sustainable and inclusive. To be sure, other ingredients are needed as well – as reflected in the other priority areas of the IPoA – and building productive capacities should thus be seen as a necessary but insufficient condition for LDC development.

An integral part of the effort to develop productive capacities is the need to measure their levels and specify benchmarks against which conditions and the state of such capacities may be assessed. This exercise is not of mere academic interest, but is of great value for policymaking. After all, it is clearly more effective to know where one is and where one wants to go before deciding on which route to take. It is also useful to measure and benchmark the level of productive capacities in order to review how far one has come and why. Monitoring assists in evaluating where past policy choices may have gone right or wrong and, consequently, points to policies, processes and actions that need to be remedied or embraced. Yet another potential benefit from measuring and benchmarking is the insights that may be discerned from cross-country comparisons. Quantitatively assessing productive capacity levels past, present and future (aspired) for several countries can provide valuable lessons learned and best – as well as worst – practices.

In theory, productive capacities cover a range of issues that may be thought of as falling into one of three categories: productive resources; entrepreneurial capabilities; and production linkages. There are a number of indicators related to the various categories and subcategories, but since the indicators inherently highlight certain aspects at the expense of others, it is imperative to take into account as many as possible in order to form a comprehensive picture of the level of each country's productive capacity, although paucity of data and statistical information poses formidable challenges. Rail and road networks, telephone lines and electricity production are among the indicators related to a country's physical infrastructure, while the value added share of manufacturing, the share of employment in manufacturing and diversification indices are valuable indicators for reviewing the role of manufacturing in an economy. Although a high number of indicators is welcome in that they help to provide a broad view of a country's condition and progress, their multitude also presents a challenge in terms of how they may be condensed to a comprehensible and balanced summary of the conditions of productive capacities in LDCs.

The remainder of this report is as follows: section II explores in greater detail the concept and contexts related to productive capacity – its definition, what it involves and the main reasoning behind it – and how the IPoA treats the issue; section III presents the most recent data available on productive capacity indicators in LDCs and compares and contrasts this data with the internationally agreed objectives and targets. It compares productive capacity indicators across countries and, where possible, highlights best practices and includes what-if analyses; section IV seeks to encapsulate the levels of productive capacities in LDCs in single summary values that constitute a productive capacities index – the first of its kind when it comes to LDCs; and section V provides policy conclusions and recommendations for possible actions at the national and international levels.

II. Productive capacity: The concept, the context and its importance in the Istanbul Programme of Action

The part of the IPoA that is devoted to productive capacity opens with the following paragraph (para. 44) on its significance for LDCs:

> Least developed countries' economies feature limited productive capacities, which constrain their ability to produce efficiently and effectively and to diversify their economies. This handicap translates into binding supply constraints and ultimately into weak export and economic potentials and limited productive employment generation and social development prospects. Building a critical mass of viable and competitive productive capacity in agriculture, manufacturing and services is essential if least developed countries are to benefit from greater integration into the global economy, increase resilience to shocks, sustain inclusive and equitable growth as well as poverty eradication, achieve structural transformation, and generate full and productive employment and decent work for all.

Clearly, productive capacities matter a great deal. Yet what do they actually consist of and what is it about them that makes them so important? This section attempts to respond to these and related questions by, first discussing the conceptual underpinning of productive capacities and second relating them to the IPoA and the specific circumstances and contexts of LDCs.

A. What are productive capacities and why are they important?[1]

The concept of productive capacities is one that seems straightforward at first glance and about which people may have a general idea. However, when the concept is closely examined, it becomes clear that it is increasingly complex and multidimensional. It is, for instance, not immediately clear whether capacities to produce should be understood in a narrow sense (for example, a focus on factors of production themselves) or a broad sense (for example, including production systems in which actors operate). Nor is the extent to which productive capacities should refer to existing or potential attributes obvious; should, for example, fertile but as yet uncultivated land be considered a productive capacity or not?

It is not surprising, then, that the term productive capacities itself may well have as many definitions as there are people defining it. The United Nations Conference on Trade and Development (UNCTAD) has presented several of the definitions in circulation, which often reflect the area of focus of the author (UNCTAD, 2006). Thus, the definition of the World Trade Organization (WTO) is found to be trade-centric and that of the United Nations Industrial Development Organization is viewed as industry-focused. The Commission for Africa and the United Nations Development Programme, meanwhile, work with definitions that are centred on human capacities.

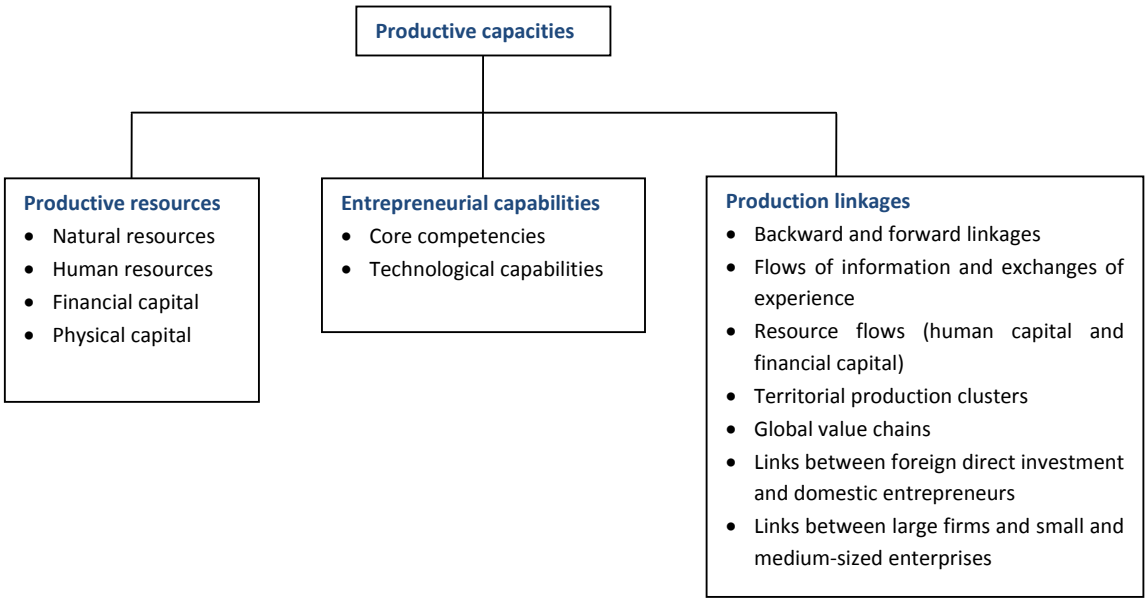
Probably the most exhaustive analysis of productive capacities in recent years is UNCTAD (2006), which defines the term broadly as "*the productive resources, entrepreneurial capabilities and production linkages which together determine the capacity of a country to*

[1] This section is essentially a summary of UNCTAD (2006), pp. 59–84 (part two, chapter 1).

produce goods and services and enable it to grow and develop".[2] According to this definition, there are three basic elements of productive capacities, which are depicted along with their main components in chart 1 and may be summarized as follows:

- Productive resources are simply another term for the factors of production: natural resources; human resources; financial capital; and physical capital.
- Entrepreneurial capabilities concern the skills, knowledge and abilities of enterprises to mobilize productive resources and to invest in, innovate and upgrade products and their quality, and to create markets. Enterprises are here understood in a broad sense that encompasses households. The two components of entrepreneurial capabilities are core competencies and technological capabilities; the former deal with routine knowledge, skills and information in the production of and competition in goods and services and the latter may be thought of as being concerned with advancing existing competencies.
- Production linkages refer to the flows and movements between enterprises and between different types of economic activity that take place in supply chain networks. The complexity of production systems means that production linkages can take many forms: flows of goods and services through backward and forward linkages; flows of information and knowledge; flows of productive resources; linkages within networks of territorial clusters; and linkages between large and small firms as well as between domestic and foreign firms.

Chart 1. Three basic elements of productive capacities



Source: Reproduced from UNCTAD (2006), p. 63.

The definition itself indicates why productive capacities matter for LDCs. After all, it makes intuitive sense that productive resources, entrepreneurial capabilities and production linkages are vital components of the state and development of any economy. Intuition is not a rigid argument, however, and a more detailed analysis of the importance of productive

[2] Ibid., p. 61 (emphasis in the original).

capacities is therefore needed. In this regard, it is useful to consider the impact of productive capacities on economic growth on the one hand and on poverty reduction on the other.

The importance of productive capacities for economic growth is founded on a feedback loop. The building of productive capacities results in a relaxation of supply-side constraints, which supports economic growth. Economic growth, in turn, induces rises in demand that prompt additional utilization and development of productive capacities. Such a virtuous circle between productive capacities and economic growth through the mechanism of supply-side and demand-side factors yields three insights for policymaking. First, the process does not only evolve generically, but is also activity-specific and enterprise-specific. Thus, developments in productive capacities at the sectoral level complement economy-wide processes. Second, it highlights that one major problem may be that productive resources are not fully utilized and gives due attention to possible underemployment; a feature that is particularly pertinent for LDCs. Third, the feedback loop between productive capacities and economic growth implies that the process is cumulative and evolutionary, whereby "certain prerequisites have to be in place before other developments can take place".[3]

A positive feedback loop also forms the basis for the significance of productive capacities for poverty reduction. Again, the flows between the two are stimulated by both supply-side factors and demand-side factors. The supply-side boost that occurs through building productive capacities can have three main implications for poverty reduction. First, it can expand productive employment, which can result in real wage increases. Second, it can entail lower prices, including for food. Third, it can raise Government revenue and, indirectly, contribute to improved social services and better governance. A reduction in poverty, meanwhile, can induce the development of productive capacities through the demand side. On the one hand, higher incomes can lead to people investing in education, health, nutrition and skills formation, which in itself is a boost to an economy's productive capacities. On the other hand, poverty reduction can increase consumption demand that, in turn, stimulates the building of productive capacities. A third channel is its possible impact on entrepreneurship, as a reduction in poverty can allow people to take more long-term views and increase their willingness to take on greater risk, which might lead to a general rise in productive entrepreneurship.

Although it is important to have a clear definition of productive capacities and to understand why they are important, what is of most practical interest is how they may be developed. As UNCTAD (2006) states, "for policymakers, what productive matters *are* matters less than what they can *become*".[4] The report proposes that productive capacities may be viewed as developing through three core processes – capital accumulation, technological progress and structural change – that, in turn, are influenced by three forces – demand, global integration and national and international institutions.

The three core processes are directly concerned with building productive capacities. Capital accumulation encompasses physical capital formation, human capital formation and the sustainable use of environmental assets. Technological progress covers the introduction of

[3] Ibid., p. 77.

[4] Ibid., p. 66.

"new goods and services, new or improved methods, equipment or skills to produce goods and services, and new and improved forms of organizing production through innovation".[5] Structural change refers to sectoral shifts of an economy's resources and production and changes in the patterns of inter and intrasectoral linkages as well as linkages among firms. The core processes are closely interrelated and mutually reinforce each other.

As for the three forces that influence the core processes, the impact of demand is founded on a cumulative causation process that is similar to the feedback loops discussed above, that is, growing demand stimulates the development of productive capacities that, in turn, spurs a further rise in demand and so on. Demand can derive from domestic consumption, domestic investment and net exports. Increasing global integration can have a positive influence on the three core processes by raising demand, enhancing access to knowledge and modern technologies and enhancing access to foreign capital. However, global integration can also bring downside risks, such as macroeconomic instability, a locking in of the production structures of poorer countries and rising inequality within and among countries. Institutions can facilitate the development of productive capacities by influencing the three core processes through formal institutional environments (for example, property rights) and informal institutional arrangements (for example, codes of conduct among economic agents).

B. Productive capacities and the Istanbul Programme of Action

A large part of the IPoA is devoted to the priority areas for action that LDCs and their international development partners have committed to focusing on during the present decade. There are eight priority areas in all, and productive capacities are the first listed. The other seven are agriculture, food security and rural development; trade; commodities; human and social development; multiple crises and other emerging challenges; mobilizing financial resources for development and capacity-building; and good governance at all levels.

The IPoA does not provide any explicit definition of productive capacities, but its division into eight priority areas makes it clear which are the chief issues subsumed under productive capacities and which are not. The section that deals with productive capacities consists of two main parts: an introductory part that is more generic; and a second part that is more specific.[6] The first part lists the main goals and targets that may be pursued in building productive capacities, as follows:

a) Increase significantly the value addition in natural resource-based industries, paying special attention to employment generation

b) Diversify local productive and export capability with a focus on dynamic value added sectors in agriculture, manufacturing and services

c) Significantly increase access to telecommunications services and strive to provide 100 per cent access to the Internet by 2020

d) Strive to increase total primary energy supply per capita to the same level as in other developing countries

e) Significantly increase the share of electricity generation through renewable energy sources by 2020

[5] Ibid., p. 68.
[6] Productive capacities are covered in paras. 44–55 of the IPoA.

f) Enhance capacities in energy production, trade and distribution with the aim of ensuring access to energy for all by 2030

g) Ensure that LDCs have a significant increase in combined rail and paved road mileage and sea and air networks by 2020

With respect to actions, the first part calls on LDCs and their development partners to, among others, mainstream a productive capacity development agenda, strengthen domestic financial institutions, foster economic activity and support diversification and value addition efforts. It also contains some more specific actions, such as strengthening programmes to promote agroprocessing industries and supporting efforts to develop a sustainable tourism sector. There are 11 actions in all in this part: six by LDCs; and five by development partners.

The second part consists of actions under four themes: infrastructure; energy; science, technology and innovation; and private sector development. The two former themes primarily fall under building productive resources as per the classification of UNCTAD (2006). Science, technology and innovation and private sector development, meanwhile, are more concerned with developing entrepreneurial capabilities and, especially with respect to the latter, promoting production linkages. Infrastructure refers to physical infrastructure, such as electricity, transport and information and communications technology (ICT). It includes 10 actions (six by LDCs and four by development partners). The theme of energy is concerned with production levels and, arguably most important of all, access to affordable, reliable and renewable energy. It includes seven actions (four by LDCs and three by development partners). The emphasis on developing science, technology and innovation is on establishing and strengthening institutions as well as promoting cooperation and collaboration among the pertinent actors involved in the innovation of science and technology. The theme encompasses 10 actions in all (one joint action, six by LDCs and three by development partners). Private sector development includes the promotion of small and medium-sized enterprises (SMEs) and how to overcome structural constraints that limit the growth of the private sector. It features six actions in total (four by LDCs and two by development partners).

Turning to the other priority areas of the IPoA, it is instructive to reflect on some of the issues covered that are reckoned as not falling directly under productive capacities. One such area is human and social development, which includes issues related to education, health, gender equality and social protection. With respect to human capacities, this suggests that productive capacities in the IPoA are primarily about concerns at a more macro level and less focused on matters at the individual level. Another area is “mobilizing financial resources for development and capacity-building”. Thus, goals, targets and actions that involve the boosting of financial capital resources are predominantly subsumed under this category rather than under productive capacities. It may finally be noted that the IPoA also singles out agriculture, food security and rural development; trade; and commodities as three specific priority areas for action – areas that all contain some goals, targets and measures that pertain to the development of productive capacities.

III. Productive capacities in LDCs

The previous section outlined the goals and targets in the area of productive capacities that the international community has committed to pursue in accordance with the ambition to enable half of all LDCs to meet the criteria for graduation by 2020. An important exercise to facilitate strategic policymaking in developing productive capacities is to assess the current state of LDC productive capacities vis-à-vis the declared objectives and other relevant benchmarks. This section sets out to do so.

The point of departure is the IPoA and, especially, the goals, targets and actions that it lists for productive capacities. Thus, the four main themes of the priority area are covered in this section. It also includes analyses of structural transformation in LDC economies (for a more generic assessment of their productive capacities) and of financing and investing in productive capacities (to review the efforts that have been made to develop them). In particular, this section covers the facets of productive capacities in the following order:

- Structural transformation
- Infrastructure
    - Transport
    - ICT
- Energy
- Science, technology and innovation
- Private sector development
- Financing and investing in the development of productive capacities

All subsections discuss the latest data available for a range of indicators. They compare how LDCs are progressing with respect to one another as well as against certain benchmarks and seek to identify causes for the varied performances. When relevant, they highlight best and worst practices in developing productive capacities. Some subsections also feature what-if analyses that show the progress needed to attain specified targets or particular benchmarks.

The goals and targets that feature in the analysis appear in the IPoA and hence need no further clarification. However, the discussion also includes other benchmarks that should be elaborated upon, namely other developing countries. The preferred benchmark is in most cases non-LDC developing countries; the average level of productive capacities of such a large and diverse group provides LDCs with a yardstick by which their progress may be measured and to which they can aspire. For certain indicators, the benchmark refers to the middle-income economy group as defined by the World Bank, which serves as a proxy for non-LDC developing countries. The proxy is by no means ideal, however, since 17 LDCs are classified as middle-income economies and five of the 36 low-income countries are not LDCs.[7] When possible, LDCs that fall into the middle-income category have been excluded from that group in calculating the benchmark. Finally, reference is occasionally made with

[7] The number of LDCs that fall into the various categories are as follows: 31 in the low-income economy group; 15 in the lower middle-income group; two in the upper middle-income group; and one (Equatorial Guinea) in the high-income economy group.

respect to Botswana by virtue of its prior LDC status and because, in contrast to Cabo Verde and Maldives, data is often available.

Data

Most of the data stem from the World Bank's World Development Indicators database.[8] In addition, the following sources are used for specific topics:

- Merchandise export concentration indices and value added in the manufacturing sector: UNCTADstat[9]
- Energy: International Energy Agency database and Sustainable Energy for All database, hosted by the World Bank[10]
- Official development assistance (ODA) data: Creditor Reporting System Aid Activity database, maintained by the Organization for Economic Cooperation and Development (OECD)[11]
- Women's entrepreneurship: Measuring Women Entrepreneurship by the OECD, and Aguirre et al. (2012)[12]

A comprehensive collection of data on indicators associated with the goals and targets listed in the IPoA is available on the website of the United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States).[13] This one-stop shop has three spreadsheet files with data on 120 indicators relevant to the eight priority areas of action, including productive capacities. In addition, the website has a useful metadata sheet, which contains information on "the variables and indicators to monitor, follow up and review" with respect to the IPoA.

A. Structural transformation

The section on productive capacities in the IPoA contains two goals that relate to the economic structure of LDCs: (a) to increase the value addition in natural resource-based industries; and (b) to diversify local productive and export capability, especially in agriculture, manufacturing and services. No quantitative targets are identified, which is understandable since the optimal structure of an economy differs across countries. However, by including them among the main goals in the section, it is clear that the IPoA recognizes the need for LDCs to pursue value addition and diversification in their efforts to develop productive capacities.

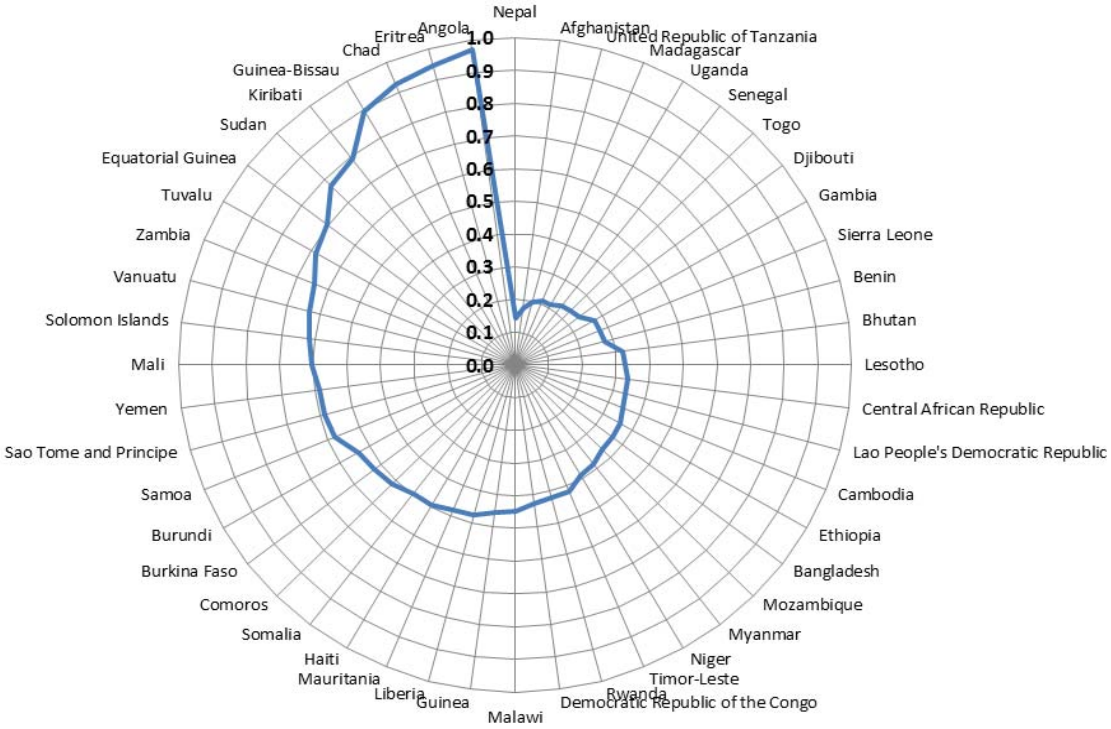
1. Diversification

The merchandise export concentration index (or Herfindahl-Hirschman index) gives an indication of the extent to which production in LDCs is specialized, and is summarized in chart 2. It shows that the concentration for 48[14] LDCs in 2011 ranged from 0.14 (Nepal) to 0.97 (Angola). The unweighted average (mean) was 0.47 and the median was 0.44. By

[8] Available at http://data.worldbank.org/data-catalog/world-development-indicators.
[9] Available at http://UNCTADstat.unctad.org.
[10] International Energy Agency data available at http://www.iea.org/stats/ and Sustainable Energy for All data available at http://data.worldbank.org/data-catalog/sustainable-energy-for-all.
[11] Available at http://stats.oecd.org/Index.aspx?datasetcode=CRS1.
[12] OECD, Measuring women entrepreneurship, in *Entrepreneurship at a Glance 2012* (OECD publishing, 2012).
[13] Specifically, the page on indicators and statistics for least developed countries is available at http://www.unohrlls.org/en/ldc/962/.

comparison, the unweighted average of all of the world's economies was 0.36 and the unweighted average of non-LDC developing economies was 0.39. This corroborates the overall impression of LDC economies as less diversified than other countries, although a relative overreliance on a limited number of products need not be of immediate concern; after all, several of the richest LDCs are also among the least diversified ones. Yet a lack of diversification can hold back the building of productive capacities and, as a result, hamper development that is sustainable in the long term.[15]

Chart 2. Merchandise export concentration index of LDCs by country, 2011



Source: UNCTADstat.

Note: The concentration index, also named the Herfindahl-Hirschman index, is a measure of the degree of market concentration. It has been normalized to obtain values ranking from 0 to 1 (maximum concentration).

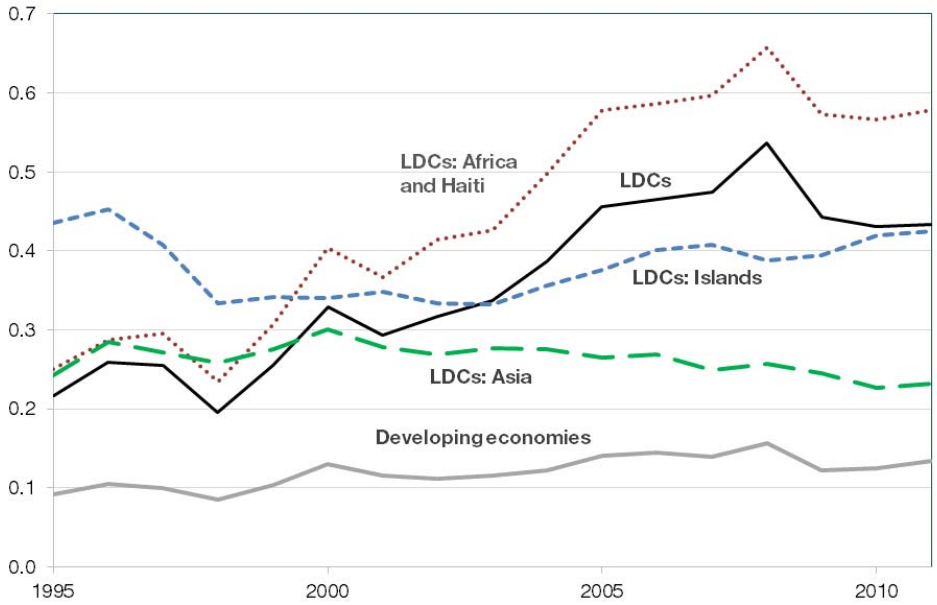
A worrying trend is that the diversification of LDC economies has narrowed over the years. Chart 3 depicts the evolution of the merchandise export concentration index since 1995 for LDCs as a whole, African LDCs and Haiti, Asian LDCs and island LDCs. It may be seen that the index value for LDCs as a group virtually doubled between 1995 and 2011 – from 0.22 to

[14] South Sudan is not included.

[15] Of course, the potential drawbacks of too limited diversification go beyond any negative impact on productive capacities, for example, a high exposure to external shocks.

0.43. It is also visually clear that this trend of a narrower export base stemmed from higher concentration levels in the group comprised of African LDCs and Haiti, where concentration surged from 0.25 in 1995 to 0.58 in 2011. The index values for Asian LDCs and island LDCs, meanwhile, remained fairly steady during the 17-year period.

Chart 3. Merchandise export concentration index of LDCs by main groups and of other developing economies, 1995–2011



Source: UNCTADstat.

There are naturally a number of factors that can explain the degree of diversification and structural transformation in an economy, including infrastructure, business environment, macroeconomic policy and Dutch disease. Papageorgiou and Spatafora (2012) make an interesting observation in their analysis of two low-income countries (Bangladesh and the United Republic of Tanzania) and two middle-income countries (Malaysia and Viet Nam). They find that reforms that come in waves can help to sustain diversification and structural transformation. In particular, they contrast the experiences of Bangladesh and Viet Nam. Bangladesh's output[16] diversified during the 1980s and early 1990s – largely as a result of the Multifibre Arrangement and the generalized system of preferences (GSP) –then levelled off due to a lack of supportive reforms. Viet Nam, meanwhile, instituted two waves of reforms in the 1980s and 1990s, respectively, which helped to maintain the momentum of diversification and structural transformation.

Case studies discussed in UNCTAD (2010) regarding the expansion of horticultural exports from Ethiopia and Uganda – two LDCs that widened their export bases between 1995 and 2011 – provide a few insights into sector-specific diversification strategies. The success in Ethiopian horticulture is partly attributed to a high level of support from the Government with strong investment incentives. With respect to Uganda, it is argued that farmer organizations with business linkages and related approaches such as contract farming have been

[16] That is, not only export goods.

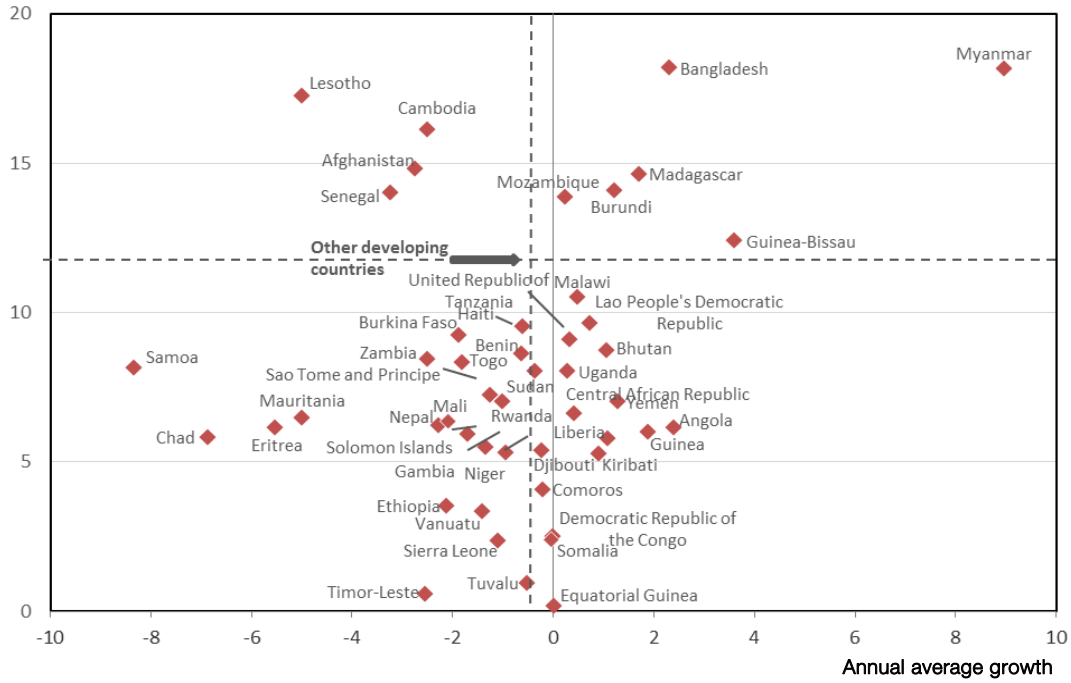
effective ways to increase production and productivity, as have linking arrangements that include international companies. The case studies also highlight constraints for the further growth of horticultural exports in both countries, including weak infrastructure, high transaction costs and lack of implementation by Governments. Although these conclusions are drawn from sector and country-specific case studies, the experiences of Ethiopia and Uganda in diversifying into horticulture point to some general lessons on strategies that may be followed or best avoided as LDCs pursue diversification and structural change in their economies.

2. Manufacturing

It is widely acknowledged that the expansion of the manufacturing sector may be a critical component of a country's structural transformation and economic development. Although structural change can also take place through resources shifting to the services sector or to higher value added activities in the primary sector, manufactures is of special interest because of the employment the sector can generate, the higher productivity levels it can spur and the close linkages that may exist among subsectors.

Chart 4 shows a mixed picture of how the role of manufactures changed in LDCs between 2002 and 2011. While over the past decade value added (see box below) in the manufacturing sector as a share of gross domestic product (GDP) decreased in 29 LDCs, it rose in 19 LDCs. Overall, the average share of manufacturing value added for all LDCs contracted by 0.7 percentage points and was primarily due to falling shares in African LDCs and island LDCs (-0.9 and -1.8 percentage points, respectively). The group comprising Asian LDCs, meanwhile, saw its average share of manufacturing value added widen by 0.9 percentage points.

Chart 4. Value added in the manufacturing sector in LDCs and other developing countries: Share of GDP, 2011 (Percentage) and change in share of GDP between 2002 and 2011 (Percentage points)



Source: UNCTADstat.
Note: The change in share of GDP for Timor-Leste is based on data for 2003 and 2011.

The chart also shows how the changing shares of value added in the manufacturing sector in LDCs compare with the average share of non-LDC developing countries: 26 LDCs experienced a more positive change between 2002 and 2011 than this group of other developing countries, whose share narrowed by 0.8 percentage points. A similar picture emerges when comparing median values: the median change in LDCs was -0.6 percentage points, while the median change in other developing countries was -1.0 percentage points. Thus, although value added in the manufacturing sector contracted in most LDCs during the past decade, the majority of LDCs had higher increases (or lower decreases) than the average and median developing country.

The share of manufacturing value added to GDP is still low in LDCs, however. In 2011, only 10 LDCs had a share that was higher than the average 12 per cent of other developing countries. It is clear, therefore, that many LDCs are starting from a low base and that their manufactures output needs to expand significantly faster than that of other developing countries if they seek to emulate the value added shares exhibited by the latter group.

The challenge of determining value addition

The emphasis on value added in the manufacturing sector notwithstanding, the IPoA expressly includes goals to raise the value in other sectors as well. This is understandable, in that it recognizes that an allocation of resources to more productive activities can occur in all sectors and that countries differ in their comparative advantages. Unfortunately, determining where the activities in a given sector take place along a value chain is difficult because data is primarily available at more aggregate levels. The data can show how important a sector is for an economy – such as the contribution of extractive industries to resource-rich LDCs or the role of services in the economies of island LDCs – but often falls short when it comes to revealing the sophistication of that sector or how much of the value added stems from downstream activities.

B. Infrastructure

The challenge of addressing the poor physical infrastructure in LDCs is given due priority in the IPoA. The section on productive capacities lists infrastructure as one of four major themes under which LDCs and their development partners are encouraged to take actions, and issues related to transport, electricity and ICT are included among the main goals and targets to be pursued. This section analyses indicators related to transport and ICT, while electricity-related indicators are discussed in the following section on energy.

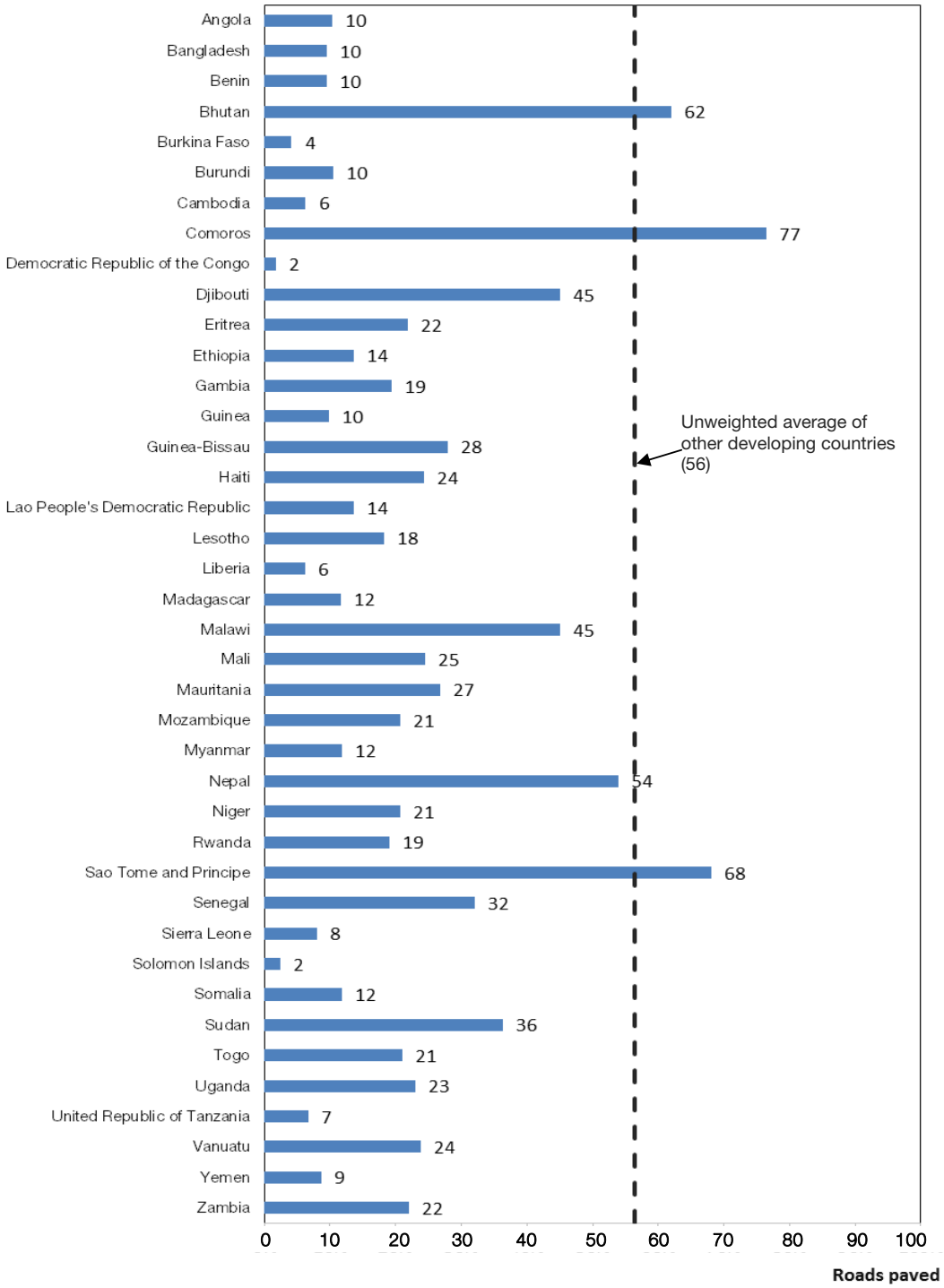
1. Transport

The IPoA goal related to transport is to ensure that LDCs have a significant increase "in combined rail and paved road mileage and sea and air networks by 2020" (para. 45(g)). The focus here is on paved roads and rail lines.

In terms of total road networks, the lowest density in LDCs is 354 km per million people, the median density is 2,147 km per million people and the highest density is 11,089 km per million people. Seven of the 41 LDCs with available data have densities that are higher than the average 3,446 km per million people found in 58 non-LDC developing countries. Botswana, by way of comparison, has an estimated density of 13,754 km per million people.

Chart 5 shows the proportion of roads in LDCs that are paved, in comparison with other developing countries. It shows that the percentage of paved roads in LDCs ranges from a low of 2 per cent to a high of 77 per cent. The average is 22 per cent and the median is 19 per cent. The unweighted average of paved roads in 50 other developing countries, meanwhile, stands at 56 per cent. Only three LDCs have a higher proportion than this, including Comoros and Sao Tome and Principe, which are the LDCs with the smallest road networks. The third LDC with a higher proportion of paved roads than other developing countries is Bhutan.

Chart 5. Proportion of paved roads in LDCs and other developing countries, 2010* (Percentage)

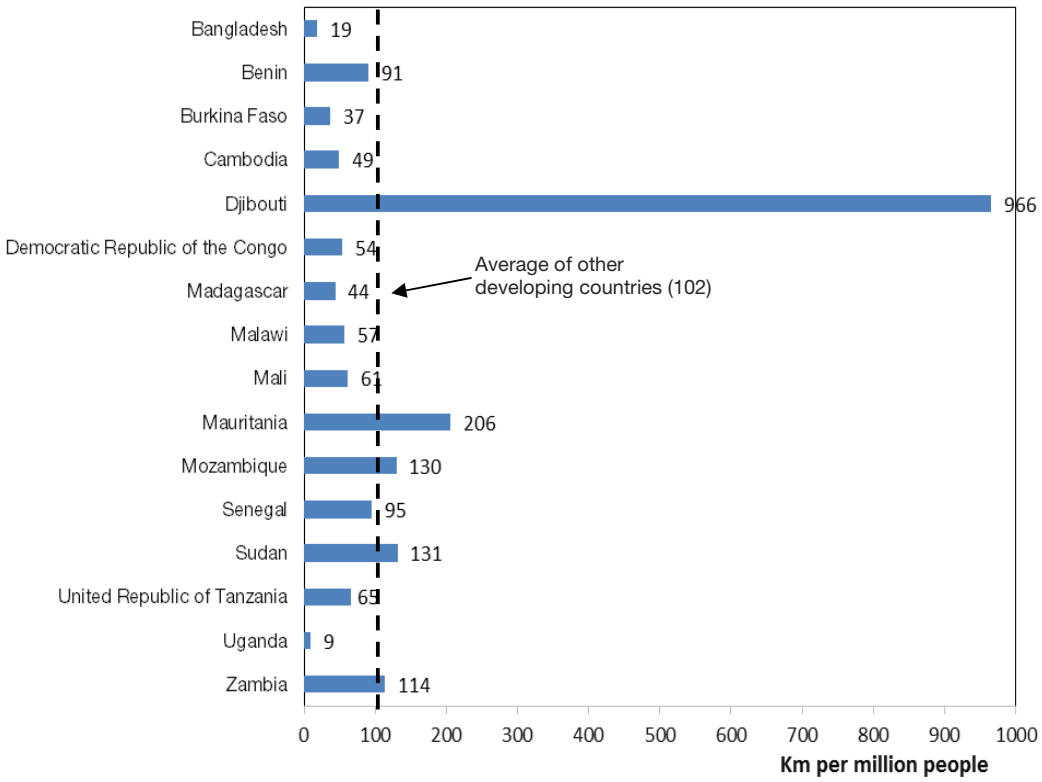


Source: World Development Indicators database.

* Or latest year available.

Rail networks in LDCs give a similar impression as road networks – at least in quantitative terms[17] – and chart 6 gives an idea of the challenge facing LDCs in establishing a similar density of rail lines as in other developing countries. It shows the km of rail lines per million people at different percentiles for 15 of the 16 LDCs for which data is available and the average of 61 non-LDC developing countries. The lowest density among LDCs is 9 km per million people, the median is 61 km per million people and the average is 77 km per million people. The highest density by far is found in Djibouti, which has an estimated density of 966 km per million people. The average density of the middle-income countries is 102 km per million people, but the median is substantially higher at 144 km per million people. As a comparison, Botswana – a country previously in the LDC category – has a density of 437 km per million people, which is slightly higher than the density in South Africa (436 km per million people) and not much lower than the density in the European Union (464 km per million people).

Chart 6. Density of rail lines in selected LDCs and the average of other developing countries, 2011*



Source: World Development Indicators database.

* Or latest year available.

Looking ahead to 2020, table 1 presents the average annual growth rates needed for LDCs to achieve the benchmark of other developing countries. The growth rates needed for paved roads in LDCs, to match the current level in other developing countries, range from 0.5 per cent per annum (Nepal) to 46.4 per cent per annum (Democratic Republic of the Congo). Three countries have already achieved the benchmark. Eleven LDCs need to increase the

[17] There is no readily available data on the quality of either road or rail networks in LDCs.

level of paved roads by 10 per cent per annum or less to achieve the benchmark of 56.4 per cent at the end of the decade. The paucity of time-series data on how the proportion of paved roads has evolved in LDCs precludes any notion of ongoing trends, but the what-if analysis nonetheless suggests that it is unlikely that a majority of LDCs will have achieved a similar proportion of paved roads as in middle-income countries by 2020.

With respect to rail lines, the rate of average annual growth that is needed for LDCs to match the density found in other developing countries ranges from a low of 0.7 per cent per annum (Senegal) to a high of 30.3 per cent per annum (Uganda). Five of the 16 LDCs have already achieved the benchmark of 101.5 km per million people. Although data reveals that LDCs have made little progress in extending their rail lines in the past decade, it seems plausible that about half of the 16 LDCs could establish a density to match the current average of non-LDC developing countries by 2020.

Table 1. Average annual growth rates in paved roads and rail lines needed in LDCs to achieve the same level as the average of other developing countries by 2020 (Percentage)

	Paved roads	Rail lines
Afghanistan	7.5	n/a
Angola	20.7	n/a
Bangladesh	21.9	20.6
Benin	21.9	1.3
Bhutan	Achieved	n/a
Burkina Faso	33.6	12.0
Burundi	20.6	n/a
Cambodia	27.6	8.5
Comoros	Achieved	n/a
Democratic Republic of the Congo	46.4	7.3
Djibouti	2.5	Achieved
Eritrea	11.1	n/a
Ethiopia	17.0	n/a
Gambia	12.6	n/a
Guinea	21.5	n/a
Guinea-Bissau	8.1	n/a
Haiti	9.8	n/a
Lao People's Democratic Republic	17.0	n/a
Lesotho	13.3	n/a
Liberia	27.8	n/a
Madagascar	19.2	9.8
Malawi	2.5	6.6
Mali	9.7	5.8
Mauritania	8.6	Achieved
Mozambique	11.7	Achieved
Myanmar	18.9	n/a
Nepal	0.5	n/a
Niger	11.8	n/a
Rwanda	12.8	n/a
Sao Tome and Principe	Achieved	n/a
Senegal	6.5	0.7
Sierra Leone	24.2	n/a
Solomon Islands	41.8	n/a
Somalia	19.0	n/a
Sudan	5.0	Achieved
Togo	10.5	n/a
Uganda	26.8	30.3
United Republic of Tanzania	11.6	5.1
Vanuatu	10.0	n/a
Yemen	23.1	n/a
Zambia	11.0	Achieved
Benchmark: Other developing countries	**56.4 per cent of roads paved**	**101.5 km per million people**

Source: UNCTAD secretariat calculations based on data from the World Development Indicators database.
Note: n/a=not available. *Or latest year available.

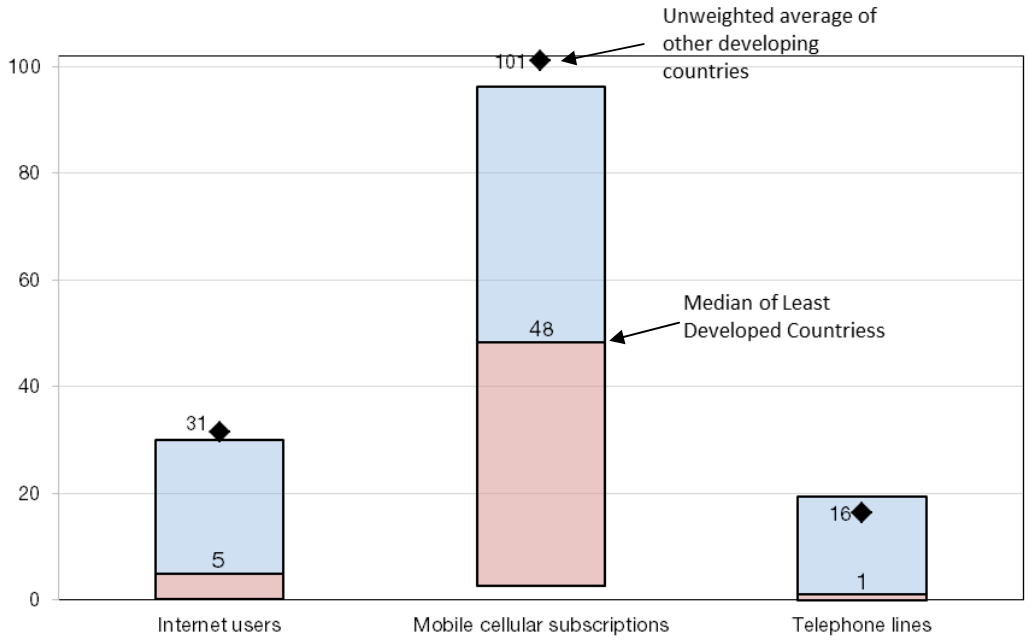
2. Information and communications technology

The IPoA section on productive capacities contains one specific goal and target that directly concerns ICT, to "significantly increase access to telecommunications services and strive to provide 100 per cent access to the Internet by 2020" (para. 45(c)). In addition, in the subsection devoted to infrastructure, LDCs commit to taking several actions related to ICT, including to "develop modern ICT infrastructure and Internet access", "build and expand broadband connectivity, e-networking and e-connectivity" and "promote public–private partnerships for the development and maintenance of transport and ICT infrastructure and their sustainability" (para. 48.1(c)–(e)).

Chart 7 summarizes the current state in LDCs with respect to three ICT indicators: Internet users; mobile cellular subscriptions; and telephone lines. It depicts the range for each indicator in LDCs as well as the medians, and juxtaposes these levels with the unweighted average of other developing countries. Unsurprisingly, the proportion of mobile telephone subscriptions per 100 people is considerably higher, on the whole, than that of Internet users or telephone lines. While the lowest level is zero or close to zero for all indicators, the highest levels are much greater for mobile telephones: 96 subscriptions per 100 people as opposed to 30 Internet users per 100 people and 19 telephone lines per 100 people. In fact, with respect to telephone lines, there are only two LDCs with landline networks that are in excess of 10 per 100 people. It should be noted, however, that the spread of mobile telephones has lessened the importance of fixed telephone lines.

The relative proportions for the three indicators for non-LDC developing countries are similar. That is, mobile cellular subscriptions have the highest unweighted average and telephone lines have the lowest, with Internet users in between (but closer to the number of landlines per 100 people). Across the three indicators, there is only one instance of an LDC with a higher level than the unweighted average of other developing countries, namely the spread of telephones lines in Samoa (19 per 100 people).

Chart 7. Internet users, mobile cellular subscriptions and telephone lines in LDCs and other developing countries, 2011* (Per 100 people)



Source: World Development Indicators database.
*Or latest year available.

The latest available values for the three indicators for all LDCs except South Sudan are listed in table 2, which also includes estimates for the average annual growth rates needed for LDCs to reach a given benchmark. The benchmark is set at 100 for Internet users and mobile cellular subscriptions, in the spirit of the expressed target in the IPoA. The benchmark for telephone lines is set at 16.3 per 100 people, which is the current unweighted average of other developing countries. The growth rates needed for Internet users are quite high – ranging from 14.3 per cent per annum to 93.7 per cent per annum – but this is of course a quickly expanding technology. In order to attain the benchmark, 29 LDCs need to register growth of 10 per cent per annum or less in mobile cellular subscriptions, which is a realistic target for another quickly expanding technology, notwithstanding the possibility of multiple subscriptions. The challenge of realizing the average annual growth rates needed to match the unweighted average of other developing countries seems the most difficult, although the benchmark is set at a low level. Only for two LDCs (Kiribati and Tuvalu) is it sufficient to achieve growth rates of less than 10 per cent per annum. However, as noted, the proliferation of mobile telephones reduces the urgency of rolling out landlines.

Table 2. Current levels and what-if analyses for Internet users, mobile cellular subscriptions and telephone lines in LDCs,2011 and target for 2020

	Internet users		Mobile cellular subscriptions		Telephone lines	
	Current level (Per 100 people)	Average annual growth rate needed (Percentage)	Current level (Per 100 people)	Average annual growth rate needed (Percentage)	Current level (Per 100 people)	Average annual growth rate needed (Percentage)
Afghanistan	5.0	39.5	54.3	7.0	0.0	94.0
Angola	14.8	23.7	48.4	8.4	1.5	29.9
Bangladesh	5.0	39.5	56.1	6.6	0.6	43.0
Benin	3.5	45.1	85.3	1.8	1.7	28.7
Bhutan	21.0	18.9	65.6	4.8	3.7	17.8
Burkina Faso	3.0	47.6	45.3	9.2	0.8	39.1
Burundi	1.1	64.9	22.3	18.1	0.3	53.2
Cambodia	3.1	47.1	96.2	0.4	3.7	17.9
Central African Republic	2.2	52.8	40.6	10.5	0.1	72.4
Chad	1.9	55.3	31.8	13.6	0.3	57.6
Comoros	5.5	38.0	28.7	14.9	3.1	20.1
Democratic Republic of the Congo	1.2	63.5	23.1	17.7	0.1	79.5
Djibouti	7.0	34.4	21.3	18.7	2.0	26.0
Equatorial Guinea	6.0	36.7	59.1	6.0	1.9	26.7
Eritrea	6.2	36.2	4.5	41.3	1.1	35.2
Ethiopia	1.1	65.1	16.7	22.0	1.0	36.6
Gambia	10.9	28.0	78.9	2.7	2.8	21.4
Guinea	1.3	62.0	44.0	9.5	0.2	65.3
Guinea-Bissau	2.7	49.6	56.2	6.6	0.3	54.2
Haiti	8.4	31.7	41.5	10.3	0.5	47.2
Kiribati	10.0	29.2	13.6	24.8	8.4	7.7
Lao People's Democratic Republic	9.0	30.7	87.2	1.5	1.7	28.4
Lesotho	4.2	42.1	56.2	6.6	1.8	28.0
Liberia	3.0	47.6	49.2	8.2	0.1	81.4
Madagascar	1.9	55.3	40.7	10.5	0.6	43.0
Malawi	3.3	45.9	25.7	16.3	1.1	34.5
Mali	2.0	54.4	68.3	4.3	0.7	42.7
Mauritania	4.5	41.1	93.6	0.7	2.0	25.9
Mozambique	4.3	41.9	32.8	13.2	0.4	52.3
Myanmar	1.0	67.2	2.6	50.2	1.1	35.1
Nepal	9.0	30.7	43.8	9.6	2.8	21.7
Niger	1.3	62.0	29.5	14.5	0.5	46.1
Rwanda	7.0	34.4	40.6	10.5	0.4	52.9
Samoa	7.0	34.4	91.4	1.0	19.3	Achieved
Sao Tome and Principe	20.2	19.5	68.3	4.3	4.7	14.7
Senegal	17.5	21.4	73.3	3.5	2.7	22.0
Sierra Leone	0.3	93.7	35.6	12.1	0.2	59.8
Solomon Islands	6.0	36.7	49.8	8.1	1.5	30.1
Somalia	1.3	62.7	6.9	34.7	1.1	35.3
Sudan	19.0	20.3	56.1	6.6	1.1	35.1
Timor-Leste	0.9	68.8	53.2	7.3	0.3	58.0
Togo	3.5	45.1	50.4	7.9	3.9	17.2
Tuvalu	30.0	14.3	21.6	18.5	14.7	1.1
Uganda	13.0	25.4	48.4	8.4	1.3	31.9
United Republic of Tanzania	12.0	26.6	55.5	6.8	0.3	53.3
Vanuatu	8.0	32.4	55.8	6.7	2.5	20.1
Yemen	14.9	23.6	47.0	8.7	4.3	13.1
Zambia	11.5	27.2	60.6	5.7	0.6	40.0
Benchmarks:	**100 per 100 people**		**100 per 100 people**		**16.3 per 100 people**	

Source: UNCTAD secretariat calculations based on data from the World Development Indicators database.
*Or latest year available.

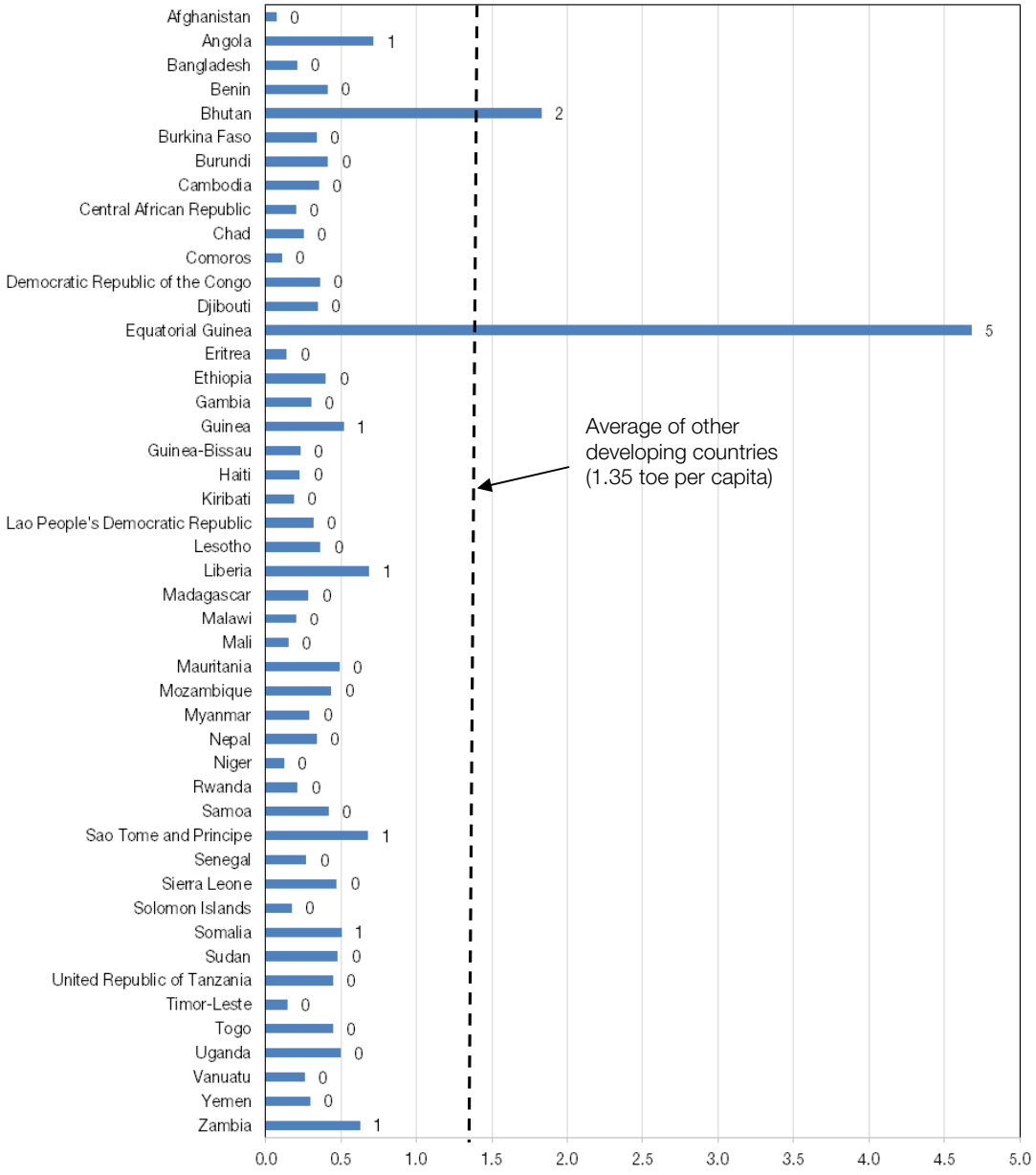
C. Energy

Energy features prominently in the IPoA, with no fewer than three goals and targets in the section on productive capacities focusing on the issue. The objectives are to (a) increase total primary energy supply (TPES) per capita; (b) increase the share of electricity generation through renewable energy sources; and (c) ensure access to energy for all through enhancing capacities in energy production, trade and distribution (para. 45(d)–(f)).

Chart 8 depicts the current levels of TPES per capita in LDCs and shows how they compare to other developing countries. Only two LDCs (Bhutan and Equatorial Guinea) have a TPES per capita that is greater than the average of other developing countries (1.83 ton of oil equivalent per capita and 4.68 ton of oil equivalent per capita, respectively). While the high TPES per capita in Equatorial Guinea is primarily due to a surge in natural gas production, the level in Bhutan can in part be attributed to its hydropower potential and the arrangements with neighbouring India to develop it.[18] The lowest TPES per capita among LDCs is 0.07 ton of oil equivalent per capita (Afghanistan) and the median is 0.34 ton of oil equivalent per capita. The average of other developing countries stands at 1.35 ton of oil equivalent per capita.

[18] International Renewable Energy Agency Renewable Energy Country Profiles. For hydropower in Bhutan, see Berkoff (2003).

Chart 8. Total primary energy supply per capita in LDCs and other developing countries, 2010 (Ton of oil equivalent per capita)



Source: World Development Indicators database.

Table 3 shows the results of a what-if analysis that estimates the average annual growth rates that LDCs need to realize in order to match the TPES per capita of other developing countries. The lowest growth rate necessary – except for the two countries that have already passed the benchmark – is 6.5 per cent per annum, while the highest is 33.7 per cent per annum. The fact that only two LDCs achieved average annual growth rates in excess of 10 per cent in 2001–2010 suggests that it may be difficult for most LDCs to reach the benchmark by 2020.

Table 3. Average annual growth rates in total primary energy supply needed in LDCs to achieve the same level as the average of other developing countries by 2020 (Percentage)

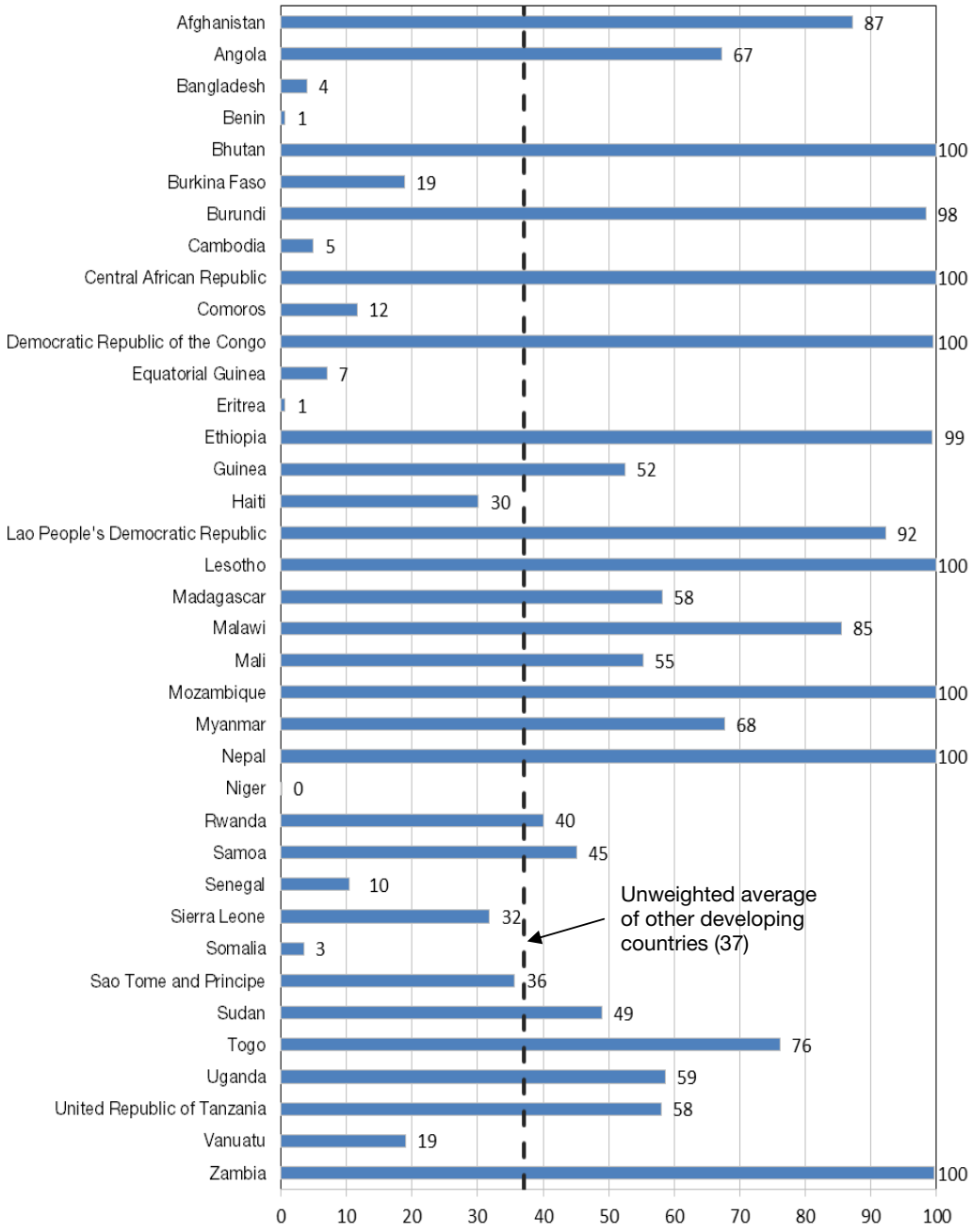
Afghanistan	33.7
Angola	6.5
Bangladesh	20.5
Benin	12.6
Bhutan	Achieved
Burkina Faso	14.7
Burundi	12.5
Cambodia	14.3
Central African Republic	20.9
Chad	18.3
Comoros	28.4
Democratic Republic of the Congo	14.1
Djibouti	14.6
Equatorial Guinea	Achieved
Eritrea	25.3
Ethiopia	12.9
Gambia	16.0
Guinea	10.0
Guinea-Bissau	19.2
Haiti	19.4
Kiribati	21.7
Lao People's Democratic Republic	15.6
Lesotho	14.0
Liberia	7.0
Madagascar	16.8
Malawi	20.9
Mali	24.3
Mauritania	10.7
Mozambique	12.0
Myanmar	16.6
Nepal	14.7
Niger	27.1
Rwanda	20.3
Samoa	12.4
Sao Tome and Principe	7.1
Senegal	17.4
Sierra Leone	11.1
Solomon Islands	22.7
Somalia	10.3
Sudan	10.9
Timor-Leste	25.0
Togo	11.7
Uganda	10.4
United Republic of Tanzania	11.7
Vanuatu	17.9
Yemen	16.3
Zambia	8.0
Benchmark: Other developing countries	**1.35 ton of oil equivalent per capita**

Source: UNCTAD secretariat calculations based on data from the Sustainable Energy for All database.

The share of renewable electricity in total electricity output in 37 LDCs is depicted in chart 9, which shows that many LDCs have very high shares of renewables, which is due to the heavy contribution of traditional biomass to total final energy consumption.[19] In fact, no fewer than seven LDCs have shares of 100 per cent and a further three LDCs have shares above 90 per cent. Moreover, the majority of LDCs for which there is available data have shares that are higher than the unweighted average share of other developing countries (37 per cent). The average share of renewable electricity for LDCs, by contrast, is 53 per cent.

[19] World Bank (2013), pp. 209–210.

Chart 9. Share of renewable electricity in total electricity output in LDCs and other developing countries, 2010* (Percentage)

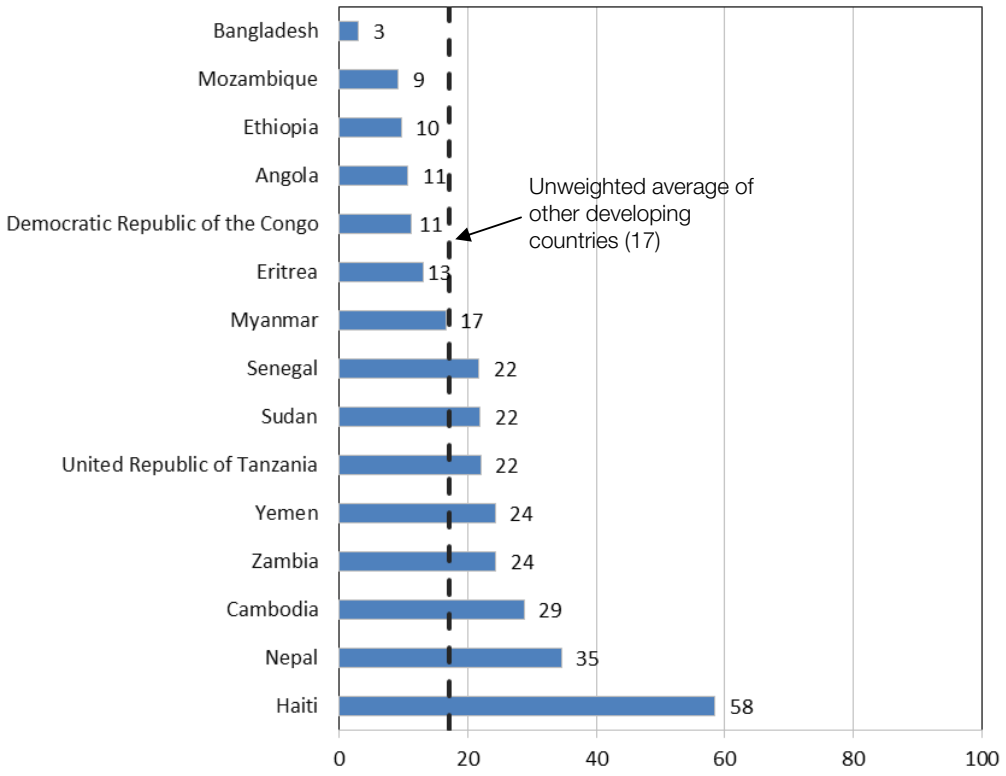


Source: Sustainable Energy for All database.
*Or latest year available.

An important component in ensuring access to energy is the amount of loss that occurs during the transmission and distribution process. The transmission and distribution losses for 17 LDCs are presented in chart 10, together with the unweighted average of other developing countries. It may be seen that seven LDCs had transmission and distribution

losses below the 17.0 per cent average of other developing countries. Notably, the transmission and distribution loss in Bangladesh stands at 3.0 per cent, which is the lowest share in the world. However, this may be an underestimation that primarily refers to transmission losses and does not take into account full distribution losses.[20] Another source puts the transmission and distribution losses at 15 per cent. However, regardless of the current level of transmission and distribution losses in Bangladesh, the sources are in agreement that there was an impressive reduction in distribution losses in the 2000s and that this reduction took place across all distribution entities.[21] The causes for this downward trend are not clear, however, although a tentative conjecture is that it may be partly attributed to an increase in the number of distribution companies as a result of electricity reforms in the mid-1990s and early 2000s.

Chart 10. Transmission and distribution losses in LDCs and other developing countries, 2010 (Percentage)



Source: Sustainable Energy for All database.

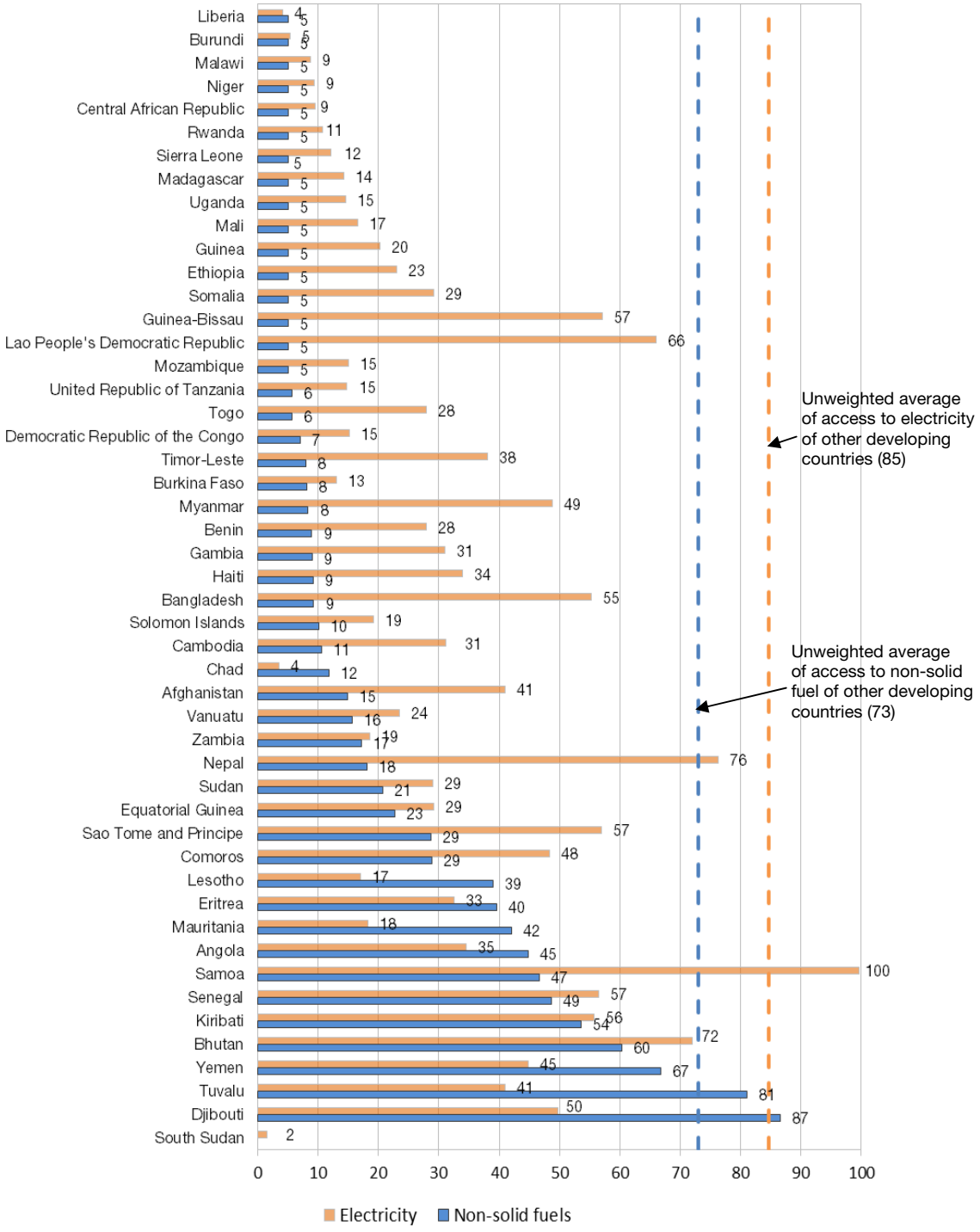
Access to energy refers to the share of the population that has access to electricity and the share of the population that has access to non-solid fuels.[22] Chart 11 shows these shares for all LDCs and the unweighted average of other developing countries in 2010. Access to electricity in LDCs ranges from 2 per cent (South Sudan) to virtually full access (Samoa), with a median value of 28 per cent.

[20] With thanks to the International Energy Agency for clarification on transmission and distribution losses in Bangladesh (correspondence).

[21] Asian Development Bank (2009), p. 6.

[22] "Non-solid fuels include (i) liquid fuels (for example, kerosene, ethanol or other biofuels); (ii) gaseous fuels (such as natural gas, liquefied petroleum gas, and biogas); and (iii) electricity. Solid fuels include (i) traditional biomass (for example, wood, charcoal, agricultural residues and dung); (ii) processed biomass (such as pellets and briquettes); and (iii) other solid fuels (such as coal and lignite)" (World Bank (2013) p. 75).

Chart 11. Access to energy (electricity and non-solid fuels) in LDCs and other developing countries, 2010 (Percentage)



Source:Sustainable Energy for All database.
Note: There is no available data on access to non-solid fuels in South Sudan.

The share of the population in LDCs that have access to non-solid fuels, meanwhile, ranges from 5 per cent (16 countries) to 87 per cent (Djibouti), with a median value of 9 per cent. The unweighted averages of LDCs are 31 per cent with respect to access to electricity and 20 per cent with respect to access to non-solid fuels. Clearly, access to energy in LDCs is considerably behind that in other developing countries, where the unweighted averages of access to electricity and access to non-solid fuels are 85 per cent and 73 per cent, respectively.

As may be expected, access to energy is higher in urban areas than in rural areas. Access to electricity in urban areas in the median LDC is at 57 per cent, while it stands at a mere 9 per cent in rural areas. The gap for non-solid fuels is narrower, but nonetheless substantial: 21 per cent in urban areas in the median LDC vis-à-vis 5 per cent in rural areas.

The goal in the IPoA is to ensure "access to energy for all by 2030" (para. 45(f)), which is in line with one of the three objectives of the Sustainable Energy for All initiative launched by the Secretary-General of the United Nations in 2011.[23] Table 4 shows estimates of the average annual growth rates needed to achieve universal access to electricity and non-solid fuels by 2030. The growth rates for electricity range from virtually 0 to 23.4 per cent per annum, while the growth rates for non-solid fuels range from 0.7 to 16.2 per cent per annum. If each LDC sustained very rapid average annual growth rates of 5.0 per cent for both indicators, 16 LDCs would be able to achieve universal access to electricity by 2030 and 11 LDCs would be able to reach the same benchmark for non-solid fuels.

Table 4. Average annual growth rates needed in LDCs to achieve universal access to energy (electricity and non-solid fuels) by 2030 (Percentage)

	Access to electricity	Access to non-solid fuels
Afghanistan	4.6	10.0
Angola	5.4	4.1
Bangladesh	3.0	12.6
Benin	6.6	12.8
Bhutan	1.7	2.6
Burkina Faso	10.7	13.4
Burundi	15.8	16.2
Cambodia	6.0	11.9
Central African Republic	12.5	16.2
Chad	18.2	11.3
Comoros	3.7	6.4
Democratic Republic of the Congo	9.9	14.2
Djibouti	3.6	0.7
Equatorial Guinea	6.4	7.7
Eritrea	5.8	4.7
Ethiopia	7.6	16.2
Gambia	6.0	12.8
Guinea	8.3	16.2
Guinea-Bissau	2.8	16.2
Haiti	5.6	12.7
Kiribati	3.0	3.2
Lao People's Democratic Republic	2.1	16.2
Lesotho	9.3	4.8
Liberia	17.3	16.2
Madagascar	10.2	16.2
Malawi	13.0	16.2

[23] The other two objectives are "to double the global rate of improvement in energy efficiency and to double the share of renewable energy in the global energy mix" (World Bank (2013) p. 10). See http://www.sustainableenergyforall.org/ for details.

	Access to electricity	Access to non-solid fuels
Mali	9.4	16.2
Mauritania	8.9	4.4
Mozambique	10.0	16.2
Myanmar	3.7	13.3
Nepal	1.4	8.9
Niger	12.6	16.2
Rwanda	11.8	16.2
Samoa	0.0	3.9
Sao Tome and Principe	2.9	6.4
Senegal	2.9	3.7
Sierra Leone	11.1	16.2
Solomon Islands	8.6	12.1
Somalia	6.4	16.2
South Sudan	23.4	not available
Sudan	6.4	8.2
Timor-Leste	5.0	13.5
Togo	6.6	15.5
Tuvalu	4.6	1.1
Uganda	10.1	16.2
United Republic of Tanzania	10.0	15.5
Vanuatu	7.5	9.7
Yemen	4.1	2.0
Zambia	8.8	9.2
Benchmark: Other developing countries	**84.7 per cent of total population**	**73.0 per cent of total population**

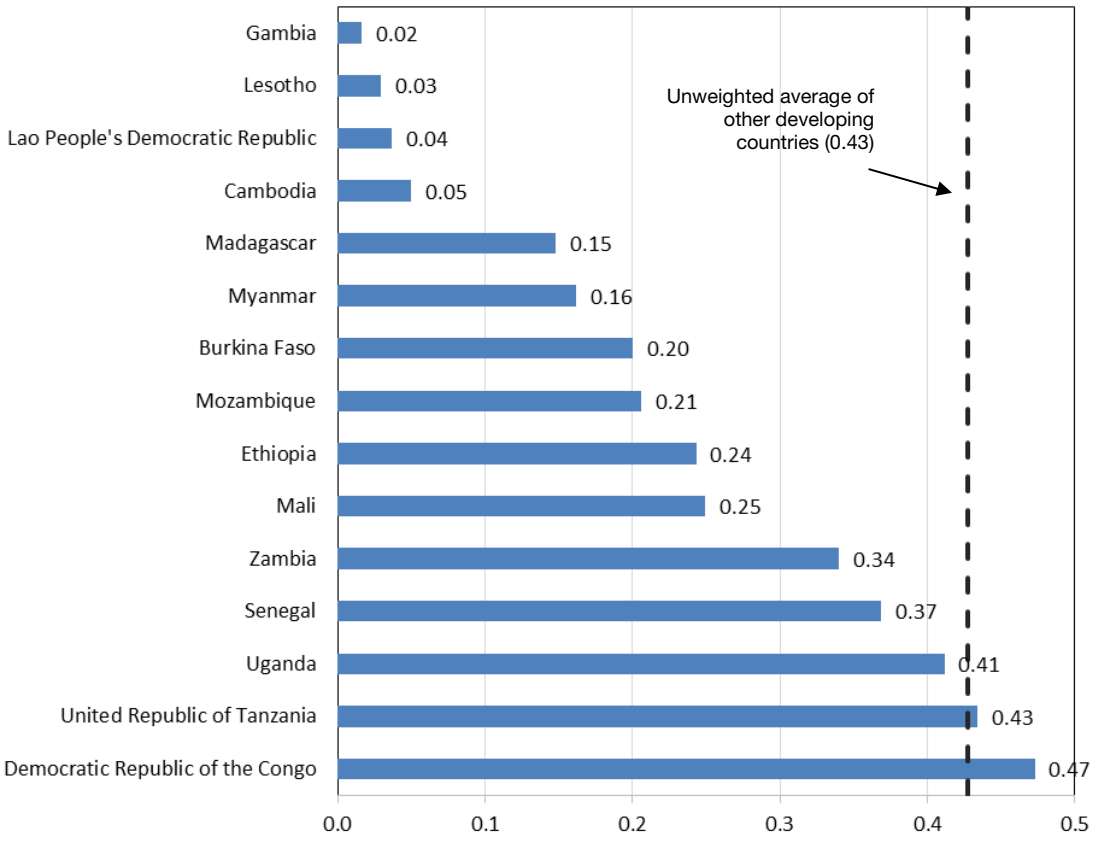
Source: UNCTAD secretariat calculations based on data from Sustainable Energy for All database.

D. Science, technology and innovation

The IPoA does not include any specific goals or targets with respect to the development of productive capacities in the area of science, technology and innovation (STI). However, a separate subsection is devoted to actions by LDCs and their development partners that should be undertaken in STI, including undertaking a joint gap and capacity analysis by 2013 with the aim of creating a technology bank and STI supporting mechanism, mainstreaming science and technology into national development and sectoral policies, ensuring that Government spending prioritizes STI, and setting up and strengthening institutions (para. 52). The focus here is on the current state in LDCs with respect to two sets of indicators: expenditure on research and development; and the proportion of researchers and technicians in research and development.

Chart 12 shows research and development spending as a share of GDP in 15 LDCs in 2010 (or the latest year available), as well as the unweighted average of other developing countries. The lowest share among LDCs is 0.02 per cent (the Gambia), the highest is 0.47 per cent (Democratic Republic of the Congo) and the median is 0.21 per cent. The unweighted average share of GDP directed to research and development in other developing countries stands at 0.43 per cent; two LDCs have shares higher than this. The median share in other developing countries, meanwhile, is 0.29 per cent; five LDCs have shares higher than this. By way of comparison, research and development spending in Botswana was 0.52 per cent of GDP in 2005.

Chart 12. Research and development expenditure LDCs and other developing countries, 2010* (Percentage of GDP)



Source: World Development Indicators database.
*Or latest year available.

A proxy for the state of research and development in LDCs is the number of researchers and technicians in research and development. These indicators are given in table 5 for 16 LDCs. The number of researchers in research and development ranges from 8 per million people to 384 per million people (the median is 34 per million people) and that the number of technicians in research and development varies between a low of 11 per million people to 142 per million people (the median is 30 per million people). The unweighted averages of other developing countries are 535 researchers per million people and 175 technicians per million people (medians are considerably lower, at 316 researchers and 80 technicians, respectively, per million people). The limited sample suggests some positive association between research and development spending and the number of researchers in research and development. However, as AU-NEPAD (2010) stresses, cross-country comparisons should be made with caution because the variation may be in part due to different definitions of the term researcher.

Table 5. Number of researchers and technicians in research and development in LDCs and other developing countries, 2010* (Per million people)

	Researchers	Technicians
Burkina Faso	45	35
Cambodia	17	13
Ethiopia	45	17
Lao People's Democratic Republic	16	not available
Lesotho	21	22
Madagascar	46	25
Malawi	30	58
Mali	38	12
Mozambique	16	35
Myanmar	18	142
Nepal	59	137
Niger	8	11
Rwanda	12	not available
Senegal	384	53
Togo	38	18
Zambia	43	67
Benchmark: Other developing countries	535	175

Source: World Development Indicators database.
*Or latest year available.

E. Private sector development

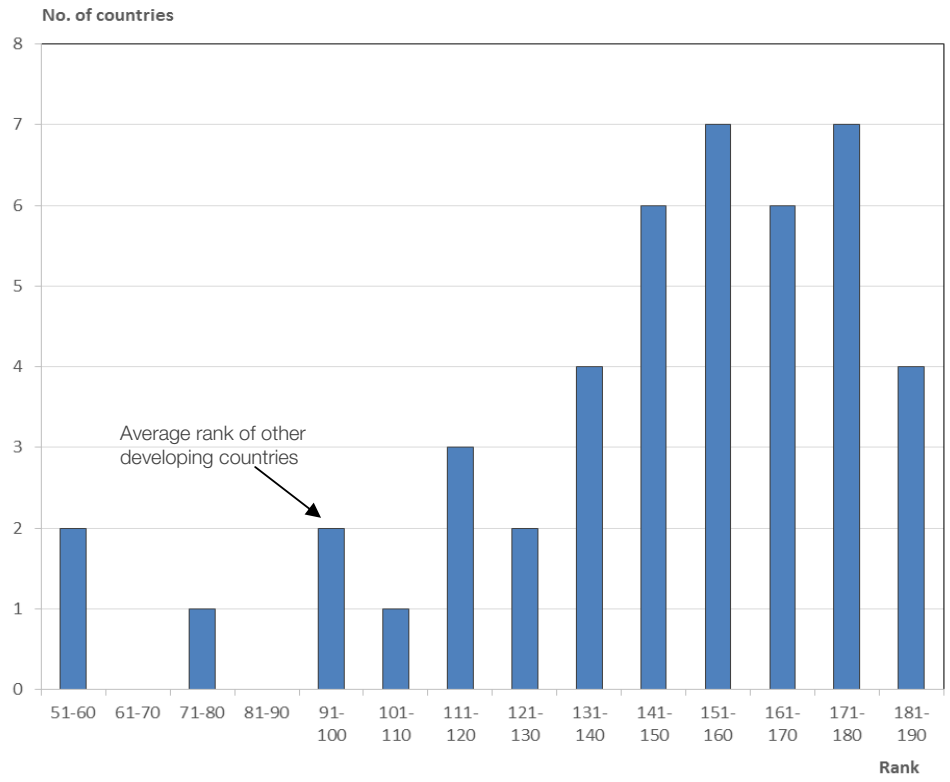
As with respect to STI, the IPoA does not contain any goals or targets concerning private sector development, but includes a subsection with several actions to be undertaken by LDCs and their development partners. Among the actions are to promote: (a) an enabling environment for private sector development; (b) greater access to financial services; and (c) women's entrepreneurship.

This subsection touches on these issues by reviewing the current state in LDCs with respect to four types of indicators: ease of doing business; logistics performance; structural policies; and involvement of women in professional life.

Chart 13 depicts the distribution of LDC rankings in the World Bank's Ease of Doing Business Index, whereby the country ranked first is regarded as having the most business-friendly regulations. The ranks range from 52 (Rwanda) to 185 (Central African Republic), which is the lowest rank in the world. As is evident from the chart, the positions of LDCs are skewed towards the lowest ranks. No fewer than 15 of the 20 countries with the least business-friendly regulations are LDCs. The average rank of LDCs is 146, while the median rank is 153. By comparison, the average rank of other developing countries is 97 and the median rank is 99. On a more positive note, several LDCs have made considerable progress in the past decade. The most familiar success story is Rwanda, which took several significant reforms in the 2000s to further private sector development, including putting in place a Doing Business Unit to lead the reform work.[24] Other LDCs that have pushed ahead with reforms and risen in the rankings include Burundi, Sierra Leone and Solomon Islands.

[24] World Bank (2013), pp. 37–41.

Chart 13. Ease of doing business rankings of LDCs and other developing countries, 2012

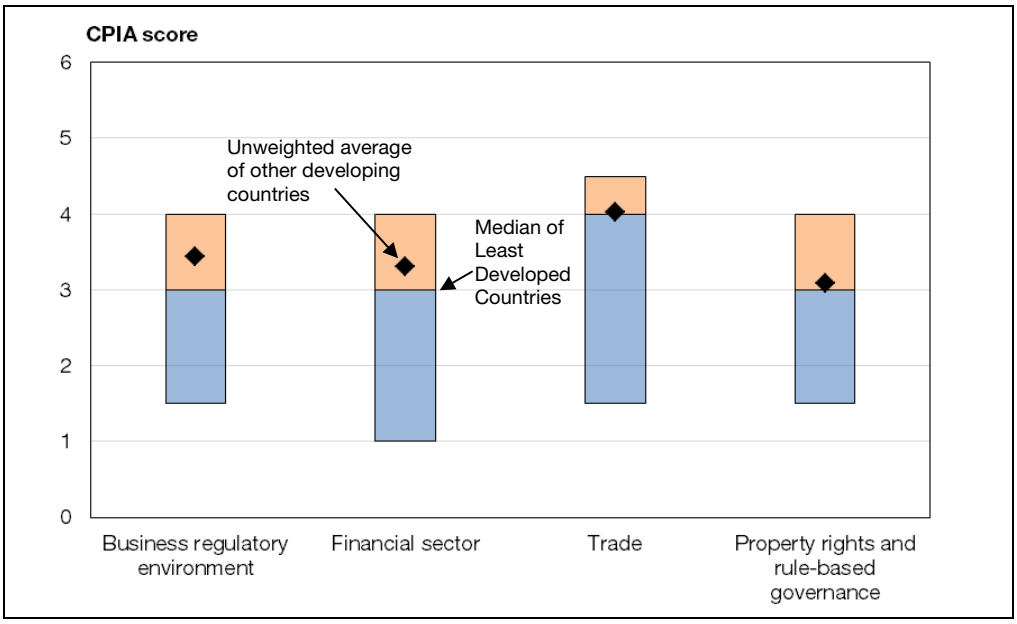


Source: World Development Indicators database.

Another index that captures part of the current level of support of private sector development in LDCs is the World Bank's Country Policy and Institutional Assessment (CPIA). Of particular interest is the structural policies cluster, which consists of three components: business regulatory environment; structure of the financial sector; and policy framework related to trade in goods. In addition, the rating on property rights and rule-based governance is pertinent because it assesses "the extent to which private economic activity is facilitated by an effective legal system and rule-based governance structure in which property and contract rights are reliably respected and enforced".[25] Chart 14 summarizes the CPIA scores for these four indicators in LDCs and also shows the unweighted average of other developing countries. The scores range from 1 to 6, whereby a higher score signifies a stronger performance. LDCs appear to have progressed the furthest in the area of trade, where the median rating is 4 in contrast to the other three components that each have a median rating of 3. In addition, trade also has the highest CPIA score (4.5) of the four indicators under review (each of the other three have a maximum score of 4). The generally higher ratings for trade policies hold for other developing countries as well, as indicated by the greater unweighted average.

[25] CPIA database.

Chart 14. Country policy and institutional assessment score for structural policies in LDCs and other developing countries, 2011 (1=lowest, 6=highest)

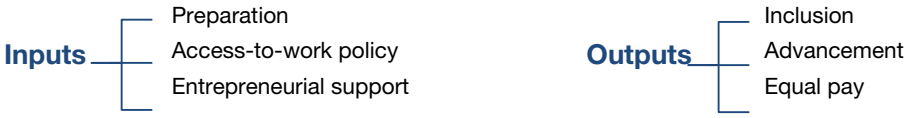


Source: World Development Indicators database.

As may be expected, there is a positive relationship between the Ease of Doing Business rankings of LDCs and their CPIA ratings, in that a better ranking is associated with a higher score. Specifically, with the exception of the CPIA trade rating, the correlations between the Ease of Doing Business rankings and the CPIA indicators are between 0.5 and 0.6. The lower correlation between trade policies and the Ease of Doing Business rankings (0.2) is not surprising, however, since the trade indicators are not as directly concerned with capturing the state of the domestic business climate as are the other three CPIA ratings.

An index that assesses the economic empowerment of women in different countries is the Third Billion Index developed by Booz and Company. This index consists of two main factors – inputs and outputs – that are made up of three elements each, as shown in Chart 15.

Chart 15. Economic empowerment of women

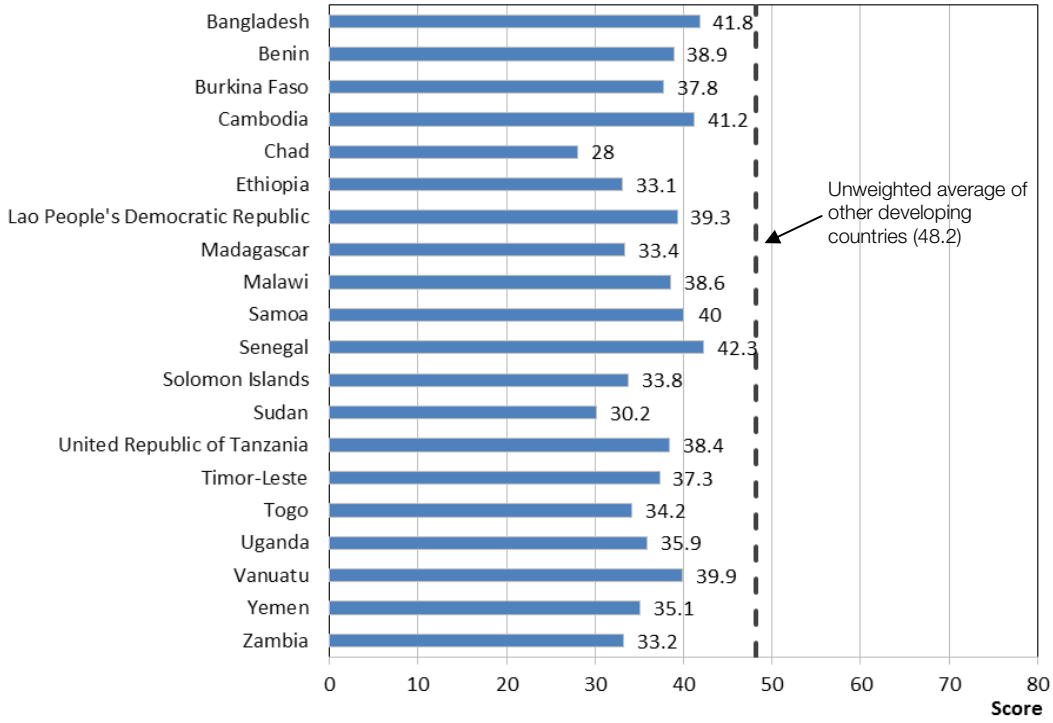


Source: Booz and Company.

As the IPoA section on productive capacities explicitly draws attention to promoting women's entrepreneurship, the focus here is on the element that deals with entrepreneurial support (See the IPoA section on human and social development and Aguirre et al. (2012) for a more comprehensive discussion on the empowerment of women).

Chart 15 depicts the entrepreneurial support scores for 20 LDCs from the Third Billion Index. The scores are arrived at by combining seven different indicators.[26] The scores range from a low of 28.0 to a high of 42.3, which means that all LDCs have scores below the average of all countries in the index (50) and below the unweighted average of other developing countries (48.2). Consequently, many LDCs are among the lowest ranked countries in terms of entrepreneurial support for women, with eight LDCs in the lowest 10 and none of the LDCs ranking higher than 98 out of 128 countries. Unequal inheritance laws in several LDCs are one concrete example of the generally weak support that LDCs provide to women entrepreneurs; a review from 2012 found that 10 out of 26 countries that did not give sons and daughters equal inheritance rights to property from their parents were LDCs.[27]

Chart 16. Entrepreneurial support for women in LDCs and other developing countries, 2012 (Third Billion Index scores)



Source: Aguirre et al. (2012).

F. Financing and investing in the development of productive capacities

The previous subsections have reviewed the state of productive capacities in LDCs under different themes. It is also of interest to examine the efforts that have been and are being made to build productive capacities. This subsection therefore considers three main

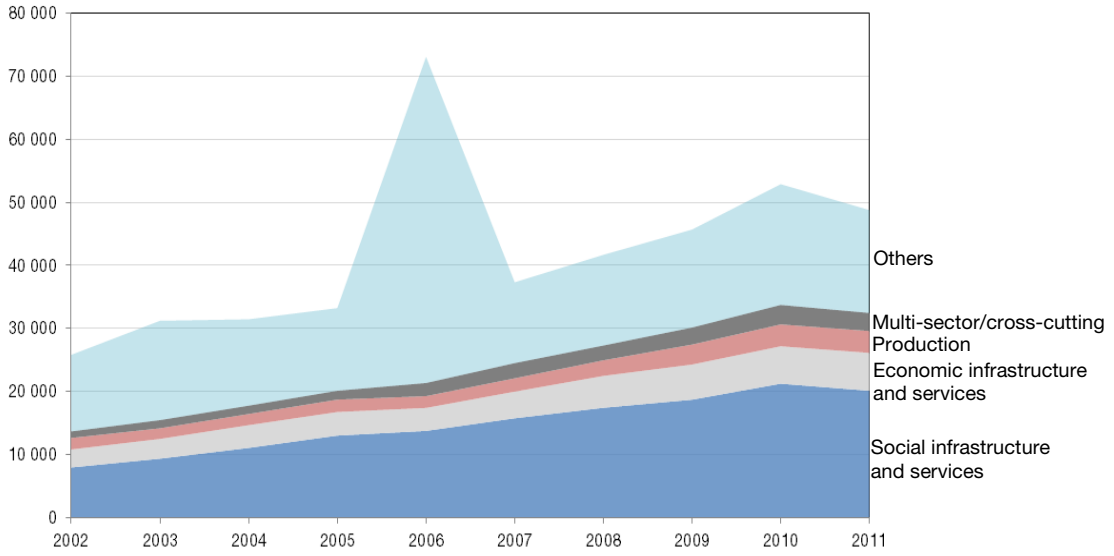
[26] Access to technology and energy, property ownership rights, support and development training for owners of SMEs, women's access to finance programmes, ability to build history, availability of private sector credit and delivery of financial services. The source for all indicators is the Economist Intelligence Unit (Aguirre et al. (2012), p. 12).

[27] World Bank (2012).

sources for financing and investing in the development of productive capacities: aid flows; gross fixed capital formation (GFCF); and Government spending on education.

Total official development assistance (ODA) to LDCs was on a general upward trend in the 2000s (chart 16). Although ODA flows expanded in all main sectors, the overall growth can primarily be attributed to aid in social infrastructure and services, which includes education, health, population and reproductive health, water supply and sanitation, and Government and civil society. ODA flows to economic infrastructure and services, which is the sector that is the most directly related to productive capacities, more than doubled in the past decade – from $2.9 billion in 2002 to $6.0 billion in 2011 (in constant 2011 terms) – but its share of total aid flows remained fairly constant during the period, often at 11 to 12 per cent.

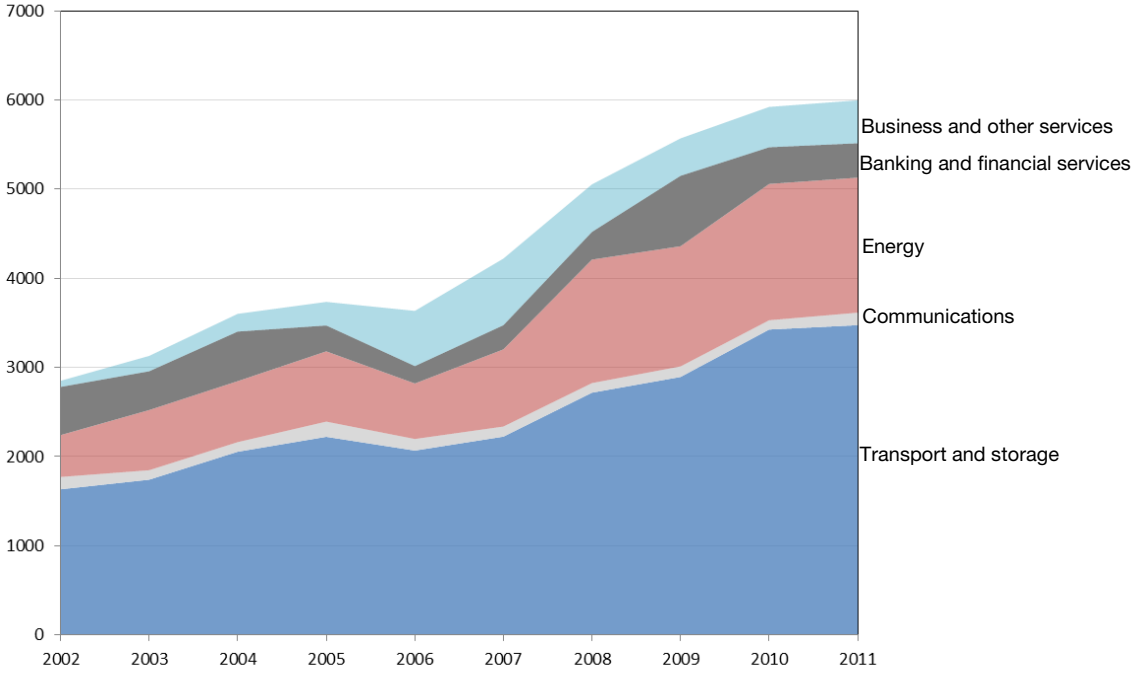
Chart 17. ODA flows to LDCs by main sector, 2002–2011
(Millions of US dollars (constant 2011 prices))



Source: Creditor Reporting System, OECD.

Chart 17 considers ODA flows to economic infrastructure and services more closely and shows that transport and storage is, by far, the area that receives the largest share of flows within the sector in LDCs; in each year of the period 2002–2011 it accounted for more than half of aid directed to the sector. In the past decade, the share of ODA flows that target energy has increased the most among the subsectors and currently makes up about one quarter of aid flows to economic infrastructure and services. The share of flows to business and other services has also expanded, while aid flows to both communications and banking and financial services have decreased in relative terms.

Chart 18. ODA flows to economic infrastructure and services in LDCs, 2002–2011 (Millions of US dollars (constant 2011 prices))



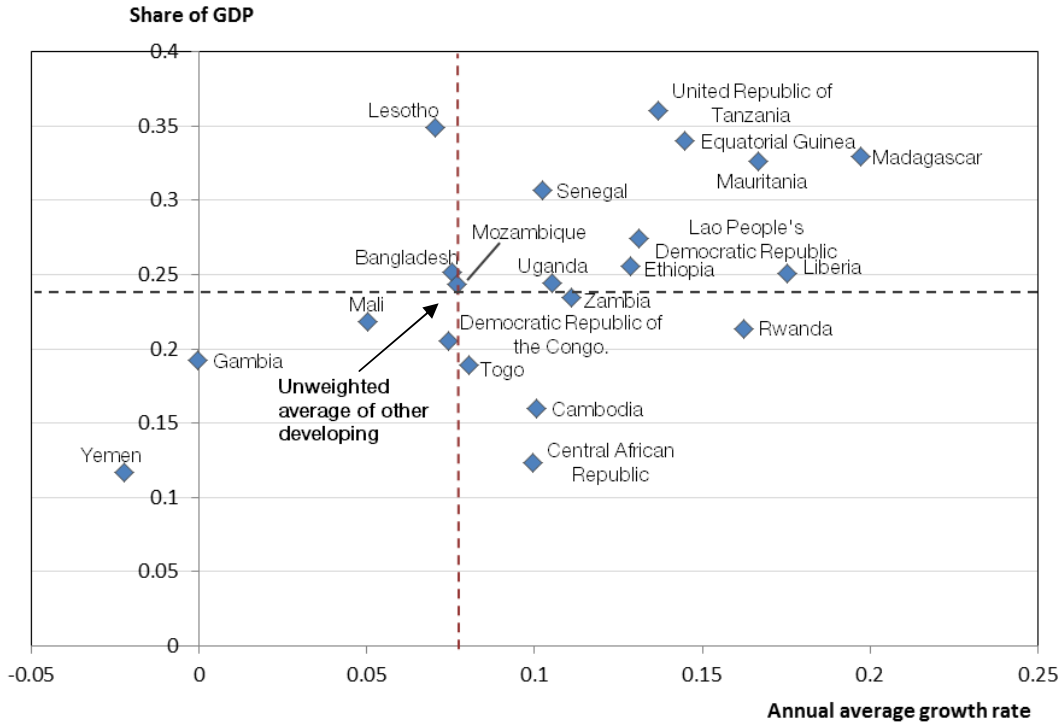
Source: Creditor Reporting System, OECD.

At the individual country level, the share of ODA directed to economic infrastructure and services during the period 2002–2011 ranged from virtually 0 per cent to 30 per cent. The median was 11 per cent, which is in line with the aggregate share of ODA flows to the sector discussed in connection with chart 16. It should be noted that, at the country level, there is considerable variation in ODA flows to the sector from one year to the next.

GFCF is one of the core processes in building productive capacities (see section II) and chart 18 plots the share of GFCF in GDP and the average annual growth rate of GFCF in 2002–2011 for 21 LDCs, as well as the unweighted average of other developing countries. It shows that nine LDCs had both shares and growth rates that were higher than for other developing countries and that both measures were comparatively lower in four LDCs. This suggests that LDCs as a group do not lag behind other developing countries in either the level or growth rate of GFCF, although LDCs should preferably have markedly higher percentages in order to be able to catch up to the overall levels of productive capacities in other developing countries.

The Brussels Programme of Action for the period 2001–2010 included the objective that LDCs should reach an investment to GDP ratio of 25 per cent per annum (para. 6). Although this particular goal is not specified in the IPoA, it may nonetheless serve as a benchmark for LDCs to strive towards. Encouragingly, several LDCs have made headway towards the 25 per cent goal; while only five out of 34 LDCs had GFCF to GDP ratios above 25 per cent in the early 2000s, there were 11 LDCs that had attained such high shares in the years around 2010. All the same, this still left some two thirds of LDCs with available data with ratios below the Brussels Programme of Action objective.

Chart 19. Gross fixed capital formation in LDCs and other developing countries, share of GDP, 2011,* and average annual growth rate, 2002–2011* (Percentage)



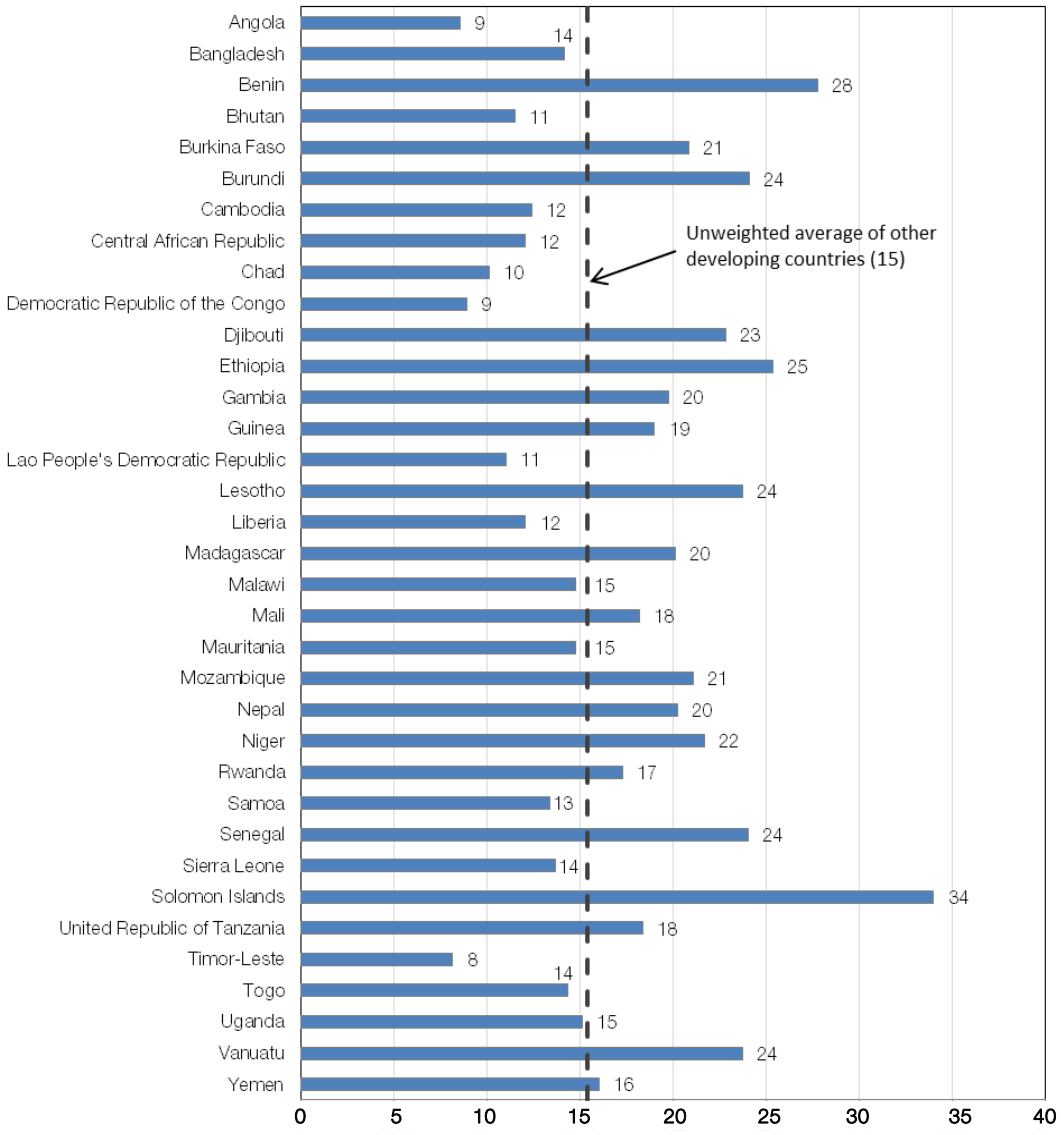
*

Source: World Development Indicators database.

* Or latest year available.

An indication of LDC efforts to invest in the development of human skills is the level of Government expenditure directed to education. Chart 19 shows this share for 35 LDCs, along with the unweighted average of other developing countries for comparison. Encouragingly, many LDCs have a higher share of public spending on education than other developing countries; in fact, LDCs have a higher unweighted average (18 per cent) and median (17 per cent) than the group of other developing countries (the unweighted average is 15 per cent and the median is 14 per cent). The consideration of LDCs with available data on spending on education over several years shows that the share has increased in some two thirds of the countries during a period of at least five years.

Chart 20. Public spending on education in LDCs and other developing countries, 2012* (Percentage of Government expenditure)



Source: World Development Indicators database.
*Or latest year available.

IV. Constructing a productive capacities index

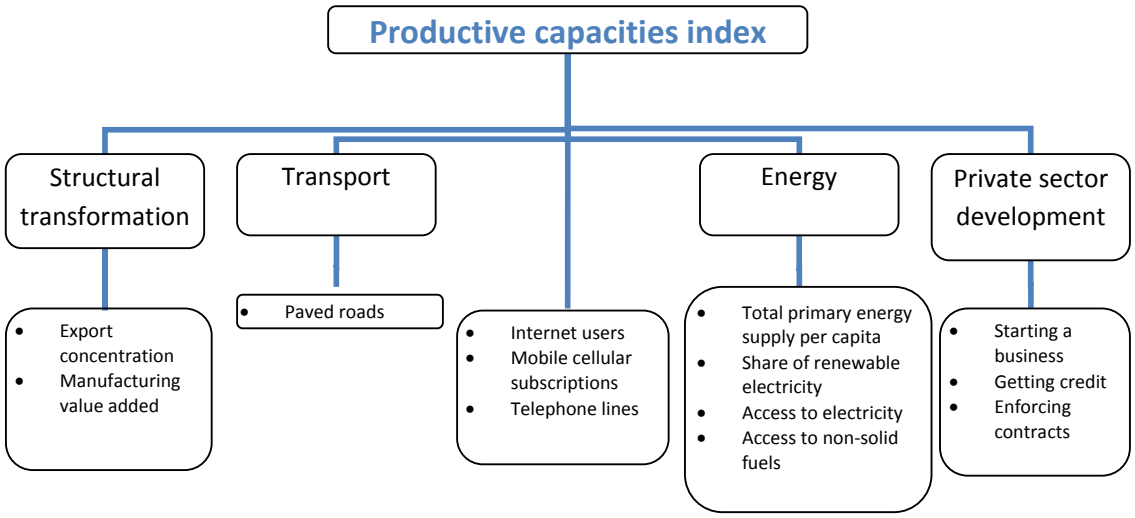
A comprehensive review of productive capacity indicators in LDCs is undoubtedly valuable, but the number and variety of variables can obscure the bigger picture of the overall state of productive capacities in a given country. That is, to adapt a well-known saying, it can become difficult to see the productive capacity wood for the indicator trees. Is it therefore possible to incorporate the various indicators into one value that encapsulates the information? This section seeks to show that it may be possible to do so through the construction of a productive capacities index (PCI).

A. Methodology

The point of reference for the PCI is straightforward: the IPoA section on productive capacities. The basis of the index is consequently various indicators that relate to the goals, targets and actions listed in that section and that have been explored in this report. However, not all indicators are included in constructing the index and the ultimate decision on the elements that make up the PCI is based on a few simple criteria. First, only indicators for which data is available for more than half of LDCs (that is, at least 25 LDCs) are considered. The rationale for this is that a larger number of LDCs able to be covered by the index is deemed to take precedence over a larger number of indicators. Consequently, the data on the share of paved roads in LDCs are included in the calculation of PCI scores, while the rail density indicator is not. Second, countries with data for more than half of the main indicator categories (see next paragraph) are given a PCI score, which means that South Sudan is the only LDC without a value. Third, none of the indicators that concern financing and investing in development of productive capacities is considered for the PCI because the focus of the index is on the state of productive capacities in LDCs rather than factors that contribute to their potential growth.

There are 13 indicators that meet these criteria and hence form the foundation of the PCI. The 13 indicators fall into one of five main categories (structural transformation, transport, ICT, energy and private sector development). This implies that the structure of the index may be thought of as consisting of three levels, whereby the top level is the PCI itself, the second level are the five categories and the third level are the 13 indicators. This three-tiered structure is depicted in chart 20.

Chart 21. Main categories and indicators of the productive capacities index



The main categories are structural transformation, transport, ICT, energy and private sector development. Thus, with the exception of structural transformation, the categories of the index correspond to the themes that feature in the IPoA. The one key theme that is absent is STI, which is simply due to the lack of data for most LDCs on any indicators pertinent to this area. With respect to the 13 indicators, they are explored earlier in this report, except for those that concern private sector development, namely starting a business, getting credit and enforcing contracts (although they are components of the Ease of Doing Business Index). The reason for focusing on these three indicators in particular, rather than the Ease of Doing Business Index as a whole, is that they appear to be closest in agreement with the actions contained in the theme of private sector development.

Construction of the PCI proceeds in three basic steps. First, scores are calculated for each indicator and LDC, which in chart 20 corresponds to the third level. The basis of the computation is how the productive capacities of LDCs compare to the simple averages of other developing countries, which serve as benchmark values. To give a specific example, with respect to paved roads, the share of each LDC is divided by the unweighted average share of the group of other developing countries. If the resulting score of an LDC surpasses the benchmark set by other developing countries (that is, whenever the calculation results in a number greater than 1), the LDC obtains a value of 1 with respect to that particular indicator in order to preclude undue weight being given to such instances. Thus, the scores always range between 0 and 1. No values are given where data is missing.

Second, the simple averages of the scores are computed within the main categories; this relates to the second level in chart 20. For instance, Lesotho's scores for Internet users, mobile cellular subscriptions and fixed telephone lines are 0.13, 0.56 and 0.11, respectively. Taking the simple average of these three values gives Lesotho an overall score of 0.27 for the ICT category. At the end of this step, therefore, each LDC with sufficient data has one overall score for each of the five main categories.

The final step is the calculation of the overall PCI score, that is, the top level in chart 20. The approach is again straightforward and entails taking the simple average of the overall scores across the five categories for each LDC. To continue with the example of Lesotho, the simple average of the country's scores in the five categories – structural transformation (0.71), transport (0.32), ICT (0.27), energy (0.50) and private sector development (0.87) – is 0.53, which is consequently Lesotho's PCI value. The higher the value, the closer the level of the country's productive capacities is to that of the developing country average (whereby an overall score of 1 signifies that the productive capacities of an LDC are at similar or higher levels than those of other developing countries across all indicators).

There are two main advantages to adopting this approach to computing PCI scores. On the one hand, the calculation of simple averages across a number of indicators is straightforward to understand and carry out. It is also a method that has been successfully implemented in the construction of other indices, such as the Ease of Doing Business Index and the UNDP Human Development Index.[28] On the other hand, the approach allows for a benchmark – the average level of productive capacities in other developing countries – against which the performances of LDCs may be measured. The benchmarking gives LDCs an indication of the state of their productive capacities vis-à-vis that of other developing countries – a significant benefit of the PCI.

Although the PCI is of potential value to LDCs and their development partners in that it seeks to capture a spectrum of diverse productive capacities in one score and that it provides LDCs with a benchmark against which their progress may be measured, it is important to bear in mind the shortcomings of the exercise. Above all, there is the problem of accurate and adequate data. Clearly, the very nature of an index hinges on the quality and quantity of data and the PCI could well appear different if additional data were available. It suffices to recall that the theme of STI is completely absent from the calculation of the PCI due to the lack of indicators with enough data within that category. Another shortcoming of the index is its admittedly weak theoretical foundation. The construction of the PCI ultimately stems from the IPoA section on productive capacities, which is a politically negotiated document with a motivation and purpose that is different from a more focused policy study. For instance, the scope of productive capacities as developed in the IPoA is not as broad as presented in UNCTAD (2006); the latter implies that an index should contain a more wide-ranging set of categories and indicators. A further consideration with respect to the methodology is that it uses the average of equally weighted indicators and categories in the calculation of the PCI. It assumes, for instance, that the five categories are of equal importance, whereas an argument could be made that some categories should be given a greater weight than others.

B. Results

Table 6 presents the PCI scores for 48 of the 49 LDCs as well as scores across the five main categories. The only LDC without a PCI score is South Sudan, due to a lack of data. Scores, as explained in the subsection on methodology, range from 0 to 1, whereby a higher score signifies that the level of productive capacities is closer to the benchmark of the unweighted average of other developing countries. The lowest PCI score among LDCs is 0.18 and the highest score is 0.78. Both the average and the median PCI scores stand at 0.45.

[28] World Bank (2005).

Table 6. Productive capacities index and main categories scores of LDCs (0=lowest, 1=highest)

	Productive capacities index	Structural transformation	Transport	Information and communications technology	Energy	Private sector development
Afghanistan	0.57	0.88	0.52	0.23	0.44	0.79
Angola	0.44	0.32	0.18	0.35	0.64	0.68
Bangladesh	0.44	0.68	0.17	0.25	0.26	0.85
Benin	0.40	0.60	0.17	0.35	0.19	0.68
Bhutan	0.78	0.57	1.00	0.52	0.92	0.89
Burkina Faso	0.35	0.51	0.07	0.20	0.26	0.73
Burundi	0.40	0.62	0.19	0.09	0.36	0.75
Cambodia	0.44	0.69	0.11	0.43	0.23	0.75
Central African Republic	0.42	0.47	n/a	0.16	0.33	0.71
Chad	0.32	0.32	n/a	0.13	0.13	0.69
Comoros	0.50	0.30	1.00	0.22	0.34	0.64
Democratic Republic of the Congo	0.26	0.26	0.03	0.09	0.39	0.55
Djibouti	0.52	0.50	0.80	0.19	0.61	0.49
Equatorial Guinea	0.41	0.10	n/a	0.30	0.46	0.77
Eritrea	0.32	0.33	0.39	0.10	0.26	0.53
Ethiopia	0.37	0.33	0.24	0.09	0.41	0.79
Gambia	0.45	0.48	0.34	0.43	0.24	0.75
Guinea	0.37	0.40	0.17	0.16	0.42	0.68
Guinea-Bissau	0.46	0.58	0.50	0.22	0.30	0.71
Haiti	0.44	0.53	0.43	0.24	0.38	0.63
Kiribati	0.49	0.30	n/a	0.32	0.51	0.81
Lao People's Democratic Republic	0.51	0.60	0.24	0.42	0.52	0.75
Lesotho	0.53	0.71	0.32	0.27	0.50	0.87
Liberia	0.35	0.38	0.11	0.20	0.21	0.83
Madagascar	0.45	0.82	0.21	0.17	0.36	0.68
Malawi	0.52	0.59	0.80	0.14	0.33	0.75
Mali	0.43	0.38	0.44	0.26	0.34	0.73
Mauritania	0.47	0.41	0.48	0.40	0.38	0.66
Mozambique	0.48	0.68	0.37	0.16	0.39	0.80
Myanmar	0.35	0.68	0.21	0.04	0.48	n/a
Nepal	0.70	0.73	0.96	0.30	0.60	0.94
Niger	0.33	0.39	0.37	0.12	0.07	0.70
Rwanda	0.46	0.45	0.34	0.22	0.34	0.94
Samoa	0.70	0.46	n/a	0.71	0.74	0.90
Sao Tome and Principe	0.63	0.42	1.00	0.54	0.63	0.55
Senegal	0.61	0.80	0.57	0.48	0.45	0.75
Sierra Leone	0.36	0.34	0.14	0.13	0.35	0.84
Solomon Islands	0.34	0.36	0.04	0.26	0.17	0.88
Somalia	0.18	0.24	0.21	0.06	0.22	n/a
South Sudan	n/a	n/a	n/a	n/a	n/a	n/a
Sudan	0.54	0.42	0.64	0.41	0.50	0.73
Timor-Leste	0.28	0.18	n/a	0.19	0.22	0.54
Togo	0.49	0.63	0.37	0.28	0.43	0.72
Tuvalu	0.52	0.14	n/a	0.69	0.74	n/a
Uganda	0.53	0.65	0.41	0.33	0.40	0.87
United Republic of Tanzania	0.49	0.72	0.12	0.32	0.40	0.89
Vanuatu	0.44	0.24	0.42	0.32	0.30	0.89
Yemen	0.45	0.41	0.15	0.40	0.55	0.74
Zambia	0.53	0.46	0.39	0.34	0.48	0.97

Source: UNCTAD secretariat calculations.
Note: n/a=not available.

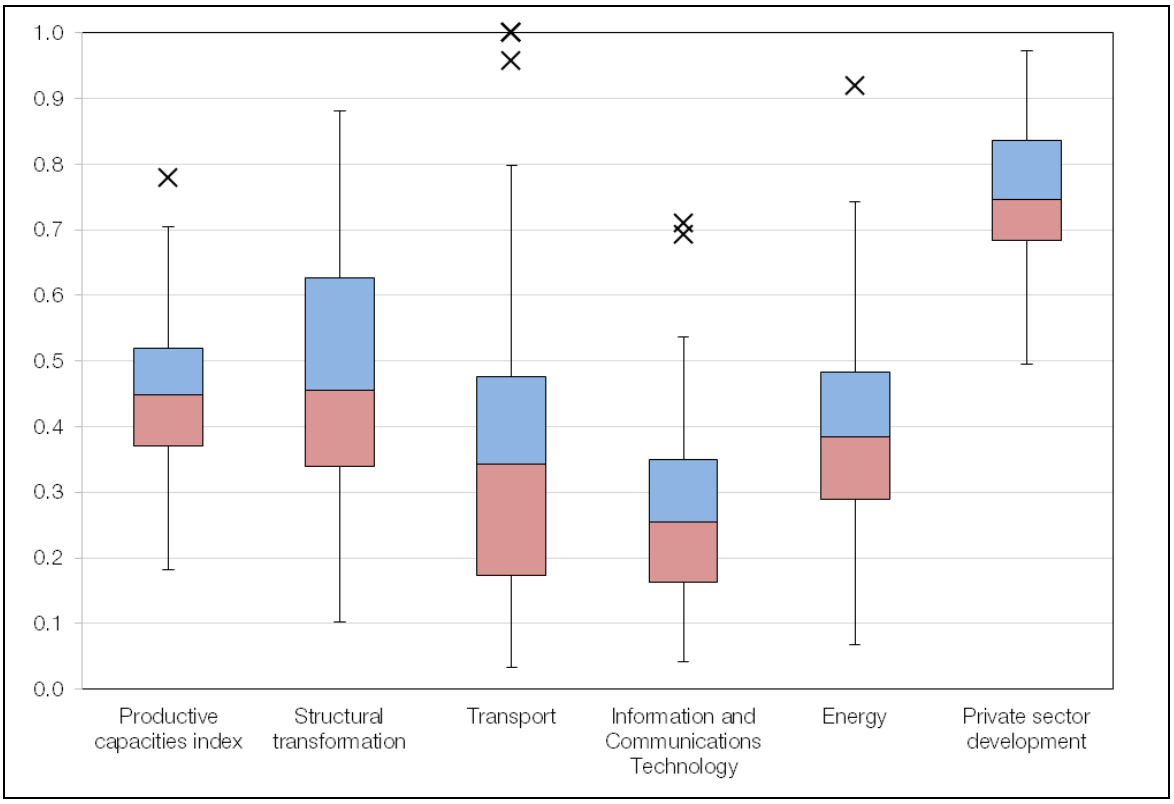
In addition to PCI scores, table 6 shows the index values for each of the five main categories. A clearer overview of the categories and PCI is given in chart 21, however, which provides the five number summary[29] in box and whisker plots. The main derivation

[29] The five number summary refers to the following data: minimum; first quartile; median; third quartile; and maximum.

from the plots is that LDCs primarily lag behind other developing countries in the areas of ICT, transport and energy, which suggests that progress in these categories would be particularly conducive to bringing productive capacities in LDCs closer to the benchmark levels.

Two additional features of chart 21 may be noted. First, the spreads of the scores are widest with respect to structural transformation and transport, that is, these are the areas in which LDCs appear to differ the most among each other and with respect to the benchmark levels. Second, there are eight outliers[30] across the PCI and its five categories: one in the PCI; four in the area of transport; two with respect to ICT; and one in the index related to energy.

Chart 22. Box and whisker plots of the productive capacities index and its main categories (0=lowest, 1=highest)



Source: UNCTAD secretariat calculations.

Note: The box and whisker plot is a visual representation of the five number summary (that is, the minimum data point, first quartile, median, third quartile and maximum). The box corresponds to the middle 50 per cent of the data range, whereby the lower and upper edges of the box represent the first and third quartile, respectively, and the line inside the box denotes the median. The whiskers extend to the furthest data points within the interval (first quartile – 1.5*(third quartile – first quartile) and third quartile + 1.5*(third quartile – first quartile)). Any data points outside this interval are referred to as outliers. Thus, the minimum scores in chart 21 are all at the ends of the whiskers, while the maximum scores in four of the plots (PCI, transport, ICT and energy) are represented by the outermost outliers (see Hogg et al. (2005) for details).

[30] Outliers are defined as data points either lower than the [first quartile-1.5*(third quartile-first quartile)] or higher than the [third quartile+1.5*(third quartile-first quartile)] (see Hogg et al. (2005) for details).

Finally, it is worth asking whether individual LDCs have similar relative scores across the various indices. For instance, does an LDC with a score lower than the first quartile with respect to transport also obtain a score lower than the first quartile in the private sector development category? The answer is that it depends, as it is conditional on which groups are under consideration. On the one hand, the 12 LDCs that have the highest PCI scores often have scores in the uppermost quartile in the five main categories and the opposite tendency may be seen with respect to the 12 LDCs with the lowest PCI scores. On the other hand, the 24 LDCs that have scores in the middle 50 per cent of the PCI data range appear to show greater variety in their relative index values across the five main categories. Thus, put differently, LDCs that have high and/or low overall levels of productive capacities tend to have high and/or low levels of productive capacities per category, while the trends are less apparent for LDCs with PCI scores in the middle.

V. Conclusion

This report assesses the state of productive capacities in LDCs in terms of a range of issues. It has been noted that the group of LDCs is, as a rule, lagging behind other developing countries on most indicators. Naturally, the LDC category is made up of a diverse collection of countries and exhibits considerable heterogeneity. The discussion has therefore centred on performances at the individual country level and has drawn attention to how LDCs vary in their productive capacities. Notwithstanding the diversity among LDCs, the overall impression from the group as a whole is that LDCs are moving in the right direction in developing productive capacities, but that the pace is slow and that the challenge to meet the professed goals and targets of the IPoA is immense. The heterogeneity of LDCs, including variations in geographical size and demography, and the diverse levels of their productive capacities, mean that decisions on the areas, objectives and policy measures that should be prioritized must be done on a case-by-case basis. Nonetheless, the IPoA is useful in providing guidance on goals, targets and actions that should form the basis of the strategies of LDCs and their development partners to build productive capacities. In addition, the following general policy recommendations may be made:

LDCs and their development partners:

- *Data.* The problem of availability of accurate and reliable data on LDCs is well known and is particularly conspicuous in a data-dense report such as this one. Even when data is available, the definition used for the collection and measurement of data may diverge from the ideal definition required for measuring productive capacities. There is no denying that there are considerable challenges in addressing the paucity of data in LDCs, but it is equally clear that the significance of improving data collection and management cannot be understated. Accurate and reliable data allows for performances to be measured across a wide set of productive capacity indicators, which are instrumental in assessing the outcomes of policies, comparing results and indicating future courses of action. Hence, LDCs and their development partners need to make additional efforts to develop the quantity and quality of data in LDCs in accordance with the Marrakech Action Plan for Statistics and the subsequent Busan Action Plan for Statistics.

Least developed countries:

- *Reforms.* There is considerable room for further improvement for LDCs across the board, as indicated by the low scores and rankings of LDCs in various indices, including the PCI. Setting up committees to study specific issues – whether cross-cutting (ease of doing business, women's entrepreneurship, etc.) or sectoral (access to energy, paved roads) – and provide detailed policy recommendations is an approach that has met with some success. In this regard, it is important that the scope and objectives of a committee are narrowly defined from the outset and that there is a clear intention to take the outcome of its work seriously. The insight that undertaking reforms is a continuous process should also steer policymaking. Thus, a big push for reform – albeit welcome – is not sufficient under all circumstances and needs to be followed up with further amendments and fine-tuning.

- *Investment.* Investment is, by definition, an integral part of building productive capacities and it is clear that a surge in investment is needed for LDCs to come close to attaining the goals and targets of the IPoA. Making concerted and sustained efforts to enhance domestic resource mobilization is paramount in this context. Domestic resource mobilization should here be understood in a broad sense, encompassing the financial sector, tax collection, remittances and capital flight.[31] The growing interest in sub-Saharan bonds is one recent positive development in the ways in which LDCs are developing their capital markets.
- *Sector or topic-specific lessons and recommendations.* There are several initiatives that focus on specific sectors or topics such as the previously mentioned Sustainable Energy for All and the Ease of Doing Business Index. The lessons learned, recommendations and best practice experiences that come out of such schemes can be of great value to LDCs. Efforts should therefore be made to monitor and engage with the most relevant initiatives and collect the main proposals and germane examples. International organizations are well placed to assist in such collection exercises.

Development partners:

- *Aid and trade flows.* ODA plays an important role in financing the development of productive capacities and the IPoA reiterates the commitment made in the Brussels Programme of Action that donor countries will implement actions to reach their respective aid targets.[32] The most ambitious target is for donor countries to provide 0.20 per cent of their gross national income as ODA to LDCs. In 2011, the aggregate share of 27 donor countries stood at 0.08 per cent; five donor countries had shares above 0.20 per cent, one country had a share in the range of 0.15 to 0.20 per cent, three countries had shares in the range of 0.10 to 0.15 per cent and the remainder had shares below 0.10 per cent. If the donor community made an effort to lift the current aggregate share of 0.08 per cent to the target of 0.20 per cent, it would entail an increase in ODA per capita in donor countries from $34 to $89. Whether donor countries raise their respective shares or not, it is imperative that LDCs and their development partners improve aid effectiveness in line with the Paris Declaration on Aid Effectiveness, the Accra Agenda for Action and the Busan Partnership for Effective Development Cooperation. In addition to augmenting the quantity of ODA and improving the quality of aid flows to LDCs, development partners can also play an important role in rebalancing the sectoral distribution of ODA. It is equally important for them to implement a decision to grant quota-free and duty-free market access for all exports of LDCs. Furthermore, continued efforts are needed to channel resources from the Aid for Trade initiative to enhance the productive and supply capacities of LDCs.

[31] See UNCTAD (2009) for a practical overview.

[32] "(a) Donor countries will implement the following actions that they committed to at the Third United Nations Conference on the Least Developed Countries as soon as possible: (i) Donor countries providing more than 0.20 per cent of their GNP as ODA to least developed countries: continue to do so and maximize their efforts to further increase ODA to least developed countries; (ii) Other donor countries which have met the 0.15 per cent target: undertake to reach 0.20 per cent expeditiously; (iii) All other donor countries which have committed themselves to the 0.15 per cent target: reaffirm their commitment and undertake either to achieve the target by 2015 or to make their best efforts to accelerate their endeavours to reach the target; (iv) During the period of the Programme of Action, the other donor countries: exercise individual best efforts to increase ODA to least developed countries with the effect that collectively their assistance to least developed countries will significantly increase; (v) Donor countries should review their ODA commitments in 2015 and consider further enhancing the resources for least developed countries" (para. 116.2).

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Data

General

Indicators and statistics for least developed countries (United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States): http://www.unohrlls.org/en/ldc/962/

World Development Indicators database (World Bank): http://data.worldbank.org/data-catalog/world-development-indicators

Structural transformation

UNCTADstat: http://UNCTADstat.unctad.org

Energy

International Energy Agency database: http://www.iea.org/stats/

Sustainable Energy for All database (World Bank): http://data.worldbank.org/data-catalog/sustainable-energy-for-all

Private sector development

Country Policy and Institutional Assessment database (World Bank): http://www.worldbank.org/ida

Women, Business and the Law (World Bank): http://wbl.worldbank.org/

Official development assistance flows

Creditor Reporting System Aid Activity database (Organization for Economic Cooperation and Development): http://stats.oecd.org/ Index.aspx? datasetcode =CRS1

Annex

The United Nations reviews the list of LDCs every three years through the Committee for Development Policy (a subsidiary body of the United Nations Economic and Social Council). The review is based on three criteria: gross national income (GNI) per capita; the human assets index; and the economic vulnerability index. The most recent review of the list of LDCs was carried out in March 2012.

A country's eligibility for inclusion in or graduation from the LDC category is determined by its scores with respect to fixed thresholds for each criterion. A country must meet all three criteria to qualify for inclusion, whereas it must meet two of the three criteria to be eligible for graduation. In addition, a country with a GNI per capita in excess of $2,380 qualifies for graduation from the LDC category, independent of its human assets index and economic vulnerability index scores. In the latest triennial review, the thresholds for inclusion in the list were: GNI per capita of $992 or less; human assets index of 60 or less; and economic vulnerability index of 36 or more. The thresholds for graduation, meanwhile, were: GNI per capita of $1,190 or more; human assets index of 66 or more; and economic vulnerability index of 32 or less.[33]

Table A1 lists the scores of LDCs and selected developing countries according to the three criteria in the 2012 triennial review.

[33] United Nations (2012), pp. 14–17.

Table A1. Criteria for identification of the LDCs, 2012

Gross national income per capita (2008–2010 average)			Human assets index			Economic vulnerability index		
L	Burundi	153	L	Somalia	1.4	L	Kiribati	82.0
L	Democratic Rep. of the Congo	170	L	Chad	18.1	L	Gambia	67.8
L	Liberia	190	L	Burundi	20.8	L	Tuvalu	63.9
L	Somalia	201	L	Central African Republic	21.6	L	Liberia	61.0
L	Eritrea	293	L	Democratic Rep. of the Congo	21.7	L	Guinea-Bissau	60.5
L	Malawi	307	L	Afghanistan	22.5	L	Eritrea	59.0
L	Sierra Leone	333	L	Niger	24.3	L	Burundi	57.2
L	Ethiopia	343	L	Sierra Leone	24.8	L	Solomon Islands	55.2
L	Niger	347	L	Ethiopia	28.2	L	Timor-Leste	53.3
L	Afghanistan	357	L	Burkina Faso	29.2	L	Zambia	53.0
L	Guinea	377	L	Mali	30.2	L	Chad	52.8
	Zimbabwe	383	L	Mozambique	30.7	L	Malawi	51.9
L	Madagascar	417	L	Angola	31.6	L	Angola	51.3
L	Mozambique	420	L	Guinea-Bissau	34.2	L	Samoa	51.1
L	Nepal	420	L	Haiti	35.6	L	Cambodia	50.5
L	Gambia	433	L	Eritrea	35.6	L	Somalia	50.1
L	Central African Republic	447	L	Guinea	36.8	L	Comoros	49.9
L	Togo	460	L	Zambia	36.9	L	Sierra Leone	48.5
L	Uganda	463	L	Liberia	38.5		Dem. People's Rep. of Korea	47.7
L	Rwanda	477	L	United Republic of Tanzania	40.1	L	Haiti	47.3
L	United Republic of Tanzania	497	L	Benin	41.1	L	Rwanda	47.3
L	Burkina Faso	507	L	Rwanda	42.2	L	Vanuatu	46.8
	Dem. People's Rep. of Korea	517	L	Djibouti	42.4	L	Djibouti	46.3
L	Guinea-Bissau	547	L	Equatorial Guinea	43	L	Sao Tome and Principe	46.1
L	Mali	563		Côte d'Ivoire	43.8	L	Lesotho	45.9
L	Chad	593	L	Malawi	44.1	L	Myanmar	45.0
L	Bangladesh	637	L	Comoros	45.3		Zimbabwe	44.9
L	Haiti	645	L	Togo	45.5	L	Sudan	44.4
L	Myanmar	704		Cameroon	45.5	L	Mozambique	44.4
L	Cambodia	707	L	Uganda	45.8	L	Bhutan	44.2
L	Comoros	727		Pakistan	45.9	L	Mauritania	44.2
L	Benin	763	L	Senegal	47.0	L	Equatorial Guinea	43.7
	Kenya	767	L	Mauritania	47.1	L	Afghanistan	38.8
L	Lao People's Dem. Republic	913	L	Timor-Leste	48.1	L	Niger	38.6
L	Mauritania	987		Nigeria	48.9		Nigeria	38.6
	Pakistan	993	L	Gambia	49.2	L	Yemen	38.5
L	Zambia	1,010	L	Yemen	52.3		Papua New Guinea	38.3
L	Solomon Islands	1,013	L	Madagascar	52.5	L	Madagascar	38.0
L	Yemen	1,020	L	Sudan	52.6	L	Burkina Faso	37.5
	Viet Nam	1,037		Papua New Guinea	53.9	L	Lao People's Dem. Republic	37.1
L	Lesotho	1,050	L	Bangladesh	54.7	L	Mali	36.8
L	Senegal	1,063		Zimbabwe	57.7	L	Uganda	36.2
	Nicaragua	1,073	L	Cambodia	57.9	L	Benin	36.2
L	Sao Tome and Principe	1,113	L	Bhutan	59.0	L	Senegal	36.1
	Côte d'Ivoire	1,130		Kenya	59.1	L	Central African Republic	35.7
	Nigeria	1,180	L	Nepal	59.8	L	Democratic Rep. of the Congo	35.4
	Cameroon	1,183		India	61.2	L	Togo	35.4
	Ghana	1,190	L	Lao People's Dem. Republic	61.4	L	Ethiopia	33.5
	Papua New Guinea	1,197	L	Lesotho	62.1	L	Bangladesh	32.4
	India	1,210	L	Solomon Islands	65.1		Nicaragua	32.0
L	Sudan	1,213	L	Myanmar	68.8		Viet Nam	30.9
L	Djibouti	1,235		Ghana	70.1	L	United Republic of Tanzania	28.7
L	Bhutan	1,700	L	Sao Tome and Principe	74.9		Ghana	28.6
L	Kiribati	1,937		Nicaragua	76.0	L	Guinea	28.6
L	Timor-Leste	2,233	L	Vanuatu	77.7	L	Nepal	27.8
L	Vanuatu	2,540		Dem. People's Rep. of Korea	83.1		Kenya	26.6
L	Samoa	2,880		Viet Nam	86.4		Cameroon	23.4
L	Angola	3,747	L	Kiribati	86.9		Pakistan	22.0
L	Tuvalu	4,993	L	Tuvalu	88.1		India	21.4
L	Equatorial Guinea	15,090	L	Samoa	92.8		Côte d'Ivoire	20.9
Memo items:								
G	Cabo Verde	3,110	G	Cabo Verde	86.8	G	Cabo Verde	35.2
G	Maldives	5,473	G	Maldives	91.7	G	Maldives	55.2

Source: Reproduced from United Nations (2012).

Note: *G* stands for graduated country and *L* stands for LDC.