



International
Labour
Office

SKILLS FOR EMPLOYMENT

Policy Brief

GREENING THE ECONOMIES OF LEAST DEVELOPED COUNTRIES: THE ROLE OF SKILLS AND TRAINING

Sustainable development and LDCs

Sustainable development is a goal for all LDCs. At the fourth UN conference on LDCs in Istanbul in May 2011, LDC leaders agreed on development objectives for the period 2011–20. These objectives call on LDCs to:

- achieve sustained, equitable and inclusive economic growth, to at least the level of 7 per cent of GDP per annum;
- build human capacities by fostering sustained, equitable and inclusive human and social development, gender equality and the empowerment of women;
- reduce vulnerability to economic, natural and environmental shocks and disasters, as well as climate change, and enhance their ability to meet these and other challenges through strengthening their resilience.

The United Nations (UN, 2012), calls for support to be given to developing countries in their efforts to achieve sustainable development and eradicate poverty. In this context, particular emphasis is placed on “green economy” policies, especially in LDCs.

Why do skills matter for LDCs?

Skills development plays a crucial role for LDCs in seizing opportunities to develop markets for new technologies, to attract investments and to create sustainable, decent and green jobs for a growing labour force.

More and better skills alone do not create jobs, yet, in conjunction with other employment and macroeconomic policy measures, they:

This policy brief draws the attention of policy-makers and social partners in least developed countries to the role of skills development in facilitating the building of greener economies, as a way to achieve sustainable development and poverty eradication. It has been written at the request of ILO constituents from LDCs, where environmental deterioration and the consequences of climate change are among the major challenges of the twenty-first century. While change is a challenge, it also offers economic and employment opportunities.

The brief arises out of the Green Jobs Initiative, a partnership between the ILO, the United Nations Environment Programme (UNEP), the International Trade Union Confederation (ITUC) and the International Organization of Employers (IOE). It draws on research applied in policy design and numerous case studies of country experiences and good practices. For more details on this work, see “Key ILO resources” listed at the end of the document

- contribute to job creation in new and potentially greener economic activities;
- enhance productivity in existing jobs and capacity to move up in value chains or economic sectors;
- help shift jobs towards more sustainable ways of production and consumption;
- help people adjust to changes and better prepare for environmental shocks and labour market transitions; and
- can act as a driver of change and innovation by spurring investment in new green economic opportunities.

The ILO supports skills development to improve the employability of workers, the productivity of enterprises and the inclusiveness of economic growth.

Box 1. The least developed countries

The category of LDCs was established in 1971 by the UN General Assembly with a view to attracting special international support for the most vulnerable and disadvantaged members of the UN family. Currently, the 49 LDCs are home to more than 880 million people (about 12 per cent of the world's population), but account for less than 2 per cent of world GDP and about 1 per cent of global trade in goods.

The identification of LDCs is based on three criteria:

- level of income, based on a three-year average estimate of GNI per capita (under US\$992 for inclusion, above US\$1,190 for graduation out of the category);
- score on the Human Assets Index (HAI), based on indicators of: (a) nutrition: percentage of population undernourished; (b) health: mortality rate for children aged five years or under; (c) education: gross secondary school enrolment ratio; and (d) adult literacy rate;
- score on the Economic Vulnerability Index (EVI), based on indicators of: (a) population size; (b) remoteness; (c) merchandise export concentration; (d) share of agriculture, forestry and fisheries in GDP; (e) share of population living in coastal zones at low elevations; (f) instability of exports of goods and services; (g) victims of natural disasters; and (h) instability of agricultural production.

A review process is used to establish threshold levels on

each of the three criteria that are then used to identify the countries to be added to or graduated from the category.

In 2012 the LDCs were distributed as follows:

Africa (34 countries):

Angola, Benin, Burkina Faso,† Burundi,† Central African Republic,† Chad,† Comoros,* Democratic Republic of the Congo, Djibouti, Equatorial Guinea, Eritrea, Ethiopia,† Gambia, Guinea, Guinea-Bissau,* Lesotho,† Liberia, Madagascar, Malawi,† Mali, † Mauritania, Mozambique, Niger,†; Rwanda, † São Tomé and Príncipe,* Senegal, Sierra Leone, Somalia, South Sudan, Sudan, Togo, Uganda,† United Republic of Tanzania, Zambia.†

Asia (14 countries):

Afghanistan,† Bangladesh, Bhutan,† Cambodia, Kiribati,* Lao People's Democratic Republic,† Myanmar, Nepal,† Samoa,* Solomon Islands,* Timor-Leste,* Tuvalu,* Vanuatu,* Yemen.

Latin America and the Caribbean:

Haiti.*

**Also a small island developing state. †Also a landlocked developing country. Source: OHRLLS, 2012. Landlocked developing countries and small island developing states.*



Greening LDC economies: challenges and opportunities

For LDCs, transition to a greener economy is not a question of choice but an economic and social necessity. These countries are already feeling the effects of environmental change and resource degradation on economic production, social well-being and employment. Poor countries have great potential to go green, given their natural endowments – notably young and growing populations and abundant natural resources – but lack the physical and financial capital and skills to realize that potential. Through investment and policy reform designed to enhance livelihoods for the poor, create employment opportunities and reduce poverty, these essential assets can be translated into economic growth and sustainable development.

Sustaining economic growth while easing the costs of structural transformation

In the years leading up to the global economic crisis in 2008, LDCs demonstrated impressive GDP growth, averaging 7 per cent annually between 2000 and 2007. However, that growth was largely dependent on rapidly rising commodity exports: the proportion of these countries' trade accounted for by fuel, ores and metal exports rose from 20 per cent to 38 per cent between 2000 and 2008. LDCs' economies depend on the use of natural resources through activities such as agriculture, forestry and mining. Natural capital accounts for a quarter of total wealth creation in low-income countries, compared to 2 per cent in high-income countries¹ (WB, 2006). A more sustain-

¹ World Bank, 2006. *Where is the wealth of nations? Measuring Capital for the 21st Century*. Washington, D.C.

nable use of natural resources is therefore critically important. This requires relevant policies which add value to natural assets, develop new markets, and create and sustain more and better jobs. The transition to greener products and services can contribute to much-needed economic diversification and higher value-added activities.

Labour productivity in LDCs, where industrialization is at an early stage, is the lowest in the world. This situation presents both technological challenges and great opportunities for “leapfrogging”, avoiding the polluting and resource-depleting stages of industrialization to adopt new, clean and more resource-efficient technologies². With appropriate policies supported by international and South–South cooperation, the necessary infrastructural developments can be facilitated, costly technology lock-ins can be avoided, and the technological and financial challenges of green industrialization can be successfully addressed. This desirable end, however, can only be achieved if relevant skills are available.

“Green restructuring” from a resource-intensive to a more resource-efficient model inevitably involves short-term costs. These are likely to have a particular effect on sectors such as extractive industries, agriculture and high carbon-emitting manufacturing, where contraction may outpace growth in the new, greener sectors.

The success of such green restructuring measures depends on making training and retraining opportunities available both to those entering the workforce and to workers in sectors that will shrink in the green transition.

Creating more and better jobs

LDCs face enormous demographic challenges, with large numbers of young people entering the labour market each year. By 2055, their populations will nearly double and their workforce is expected to increase by over 200 million by 2025 (UN-OHRLLS, 2013). At the same time, LDCs have suffered from persistent unemployment (currently at 6 per cent), especially among women and young people, resulting from jobless growth, and have very high proportions of vulnerable workers (81 per cent) and working poor (60 per cent).

The green economy offers vast employment opportunities in renewable energies and energy efficiency, public transportation and infrastructure development.

The level of urbanization in LDCs, at 30 per cent, is much lower than the world average (50 per cent). Nevertheless, the urban growth rate in LDCs is close to 4 per cent, which means that there will be around 116 million more urban dwellers in LDCs over the next decade³. With large numbers of new buildings being constructed in many LDCs, it is vitally important that new

² UNIDO, 2012. *Green growth: from labour to resource productivity*

³ UNFPA, 2011. *Population Dynamics in the Least Developed Countries: Challenges and Opportunities for Development and Poverty Reduction*.

Box 2. The importance of new skills in agriculture for LDCs

Agriculture accounts for between 30 and 60 per cent of GDP in LDCs and employs more people than any other sector. About 80 per cent of the working population in Tanzania, over 70 per cent in Nepal and Zambia, and almost half in Bhutan and Bangladesh earn their living from agriculture, forestry and fisheries. For women, the proportions are even higher than for men. Further large proportions of the population are dependent on these sectors indirectly, relying for income on activities such as wood crafts, food processing or tourism. In Ethiopia, 80 per cent of employment is still concentrated in agriculture, and fuelwood accounts for more than 80 per cent of households’ energy supply. At the same time, most LDCs have changed from being net food exporters to net food importers within the last decade due to low productivity in these sectors.



Agriculture is highly affected by climate change, which is already destroying, or forcing change on, many traditional income generation opportunities. Training is therefore vital to help people shift to new jobs and also to apply climate adaptation measures and greener practices, such as water conservation, prevention of soil loss or salination. Training can also support measures to mitigate climate change, for example through the transition to sustainable organic farming or sustainable biofuel production. To be effective, such measures need to generate higher yields and also to strictly observe best green practice, including water conservation – both of which require the dissemination of relevant skills. Finally, skills development, implemented hand in hand with other macroeconomic and employment policy measures, also contributes to economic diversification and thus reduces over-dependence on this one sector.

Sources: ILO, 2013. *Database of labour statistics, latest available year*.
Photo ©: ILO.

construction is energy and resource efficient: energy efficiency is cheap if incorporated at the start, and very expensive if retro-fitted. This has many skills implications, not only for the whole spectrum of occupations in the construction sector, but also throughout the value chain.

Most of the poorest people, however, still live in rural areas, where the need for new jobs is acute. Sustainable eco-tourism, sustainable agricultural practices (minimum tillage, crop rotation and early planting), community-based forestry, sustainable use and conservation of biodiversity, and the growing consumer demand for organic food worldwide all have potential to create new green jobs, but all require new skills and training.

A number of countries have started to seriously consider new greening opportunities for employment creation. An ILO review of countries' green jobs measures from a panel of 42 countries found that 12 countries had provisions promoting employment in environment and sustainability related areas, including nine LDCs: Bangladesh, Benin, Burkina Faso, Cambodia, the Democratic Republic of Congo, Mali, Nepal, Senegal and Tanzania (ILO, 2012).

Enhancing resilience to climate change and efficiency of resource consumption

LDCs are particularly vulnerable to the repercussions of climate change and environmental degradation. Natural disasters, droughts, floods and tropical cyclones all have detrimental effects on agriculture, forestry, fisheries and tourism, as well as destroying or damaging homes and livelihoods. While levels of carbon emissions are very low (0.2 per cent: UN-OHRLLS, 2013), energy and resource consumption is inefficient, and there is an urgent need to improve access to basic amenities such as food, clean water, energy, housing and transport.

Awareness of and adaptation to climate change, and efficiency of resource use, can be enhanced through training and capacity-building measures. These could be planned through National Adaptation Programmes of Action (NAPAs), which are prepared through a process established by the United Nations Framework Convention on Climate Change (UNFCCC) to enable LDCs to identify activities that best respond to their urgent and immediate needs to adapt to climate change. This process includes a funding mechanism for the formulation and implementation of NAPAs.

Increasing energy access

Nearly 80 per cent of the population of LDCs lack access to electricity⁴, and rural communities in particular face difficulty in lighting homes and schools, refrigerating food and medicine, and developing local businesses that rely on power supply. The widespread use of biomass as a source of energy for heating and cooking results in deforestation and desertification to the detriment of agriculture and the environment.

Provision of off-grid access to sustainable electricity generation systems contributes to rural economic development and creates jobs in distribution, installation and maintenance, as well as in businesses that make productive use of electricity. The experience of Solar Home Systems (SHS) in Bangladesh (see box



8) demonstrates that significant benefits in poverty reduction, employment creation, health and education can flow from access to electricity if the necessary skills can be developed.

Greening LDC economies: the key skills challenges

Challenge 1: Foundation skills among the workforce are weak

Although literacy rates among young people in LDCs have improved considerably, reaching 76.45 per cent in 2010 (up from 69.45 per cent in 2000), especially for young women (rising from 58 per cent in 2000 to 68 per cent in 2010 (UN-OHRLLS, 2013), there remains great scope for further progress. Persistently high illiteracy among the workforce (e.g. 70 per cent and higher in Burkina Faso, Ethiopia, South Sudan, Mali and Niger (KILM, ILO, 2011) impedes acquisition of skills.

A further, related challenge is the lack of access to primary and lower secondary education, hampering the acquisition of foundation skills. These are the skills on which an individual builds future employability, including the ability to adapt to new skills and occupational requirements throughout their working lives. A recent survey of 123 low- and middle-income countries estimates that at least 200 million 15 to 24-year-olds have not completed primary school. In Burkina Faso, Mali and Niger, all LDCs, around three in five young people have never been to school by the time they reach age 15–19, and are highly unlikely ever to have had the opportunity to do so⁵. Ensuring that all young people achieve at least a good primary and lower secondary education is vital to providing a country with the skills base necessary for economic development, diversification and a green transition.

Challenge 2: Skill shortages hold back the transition to a greener economy

Greener production and services can only flourish in countries with an adequately skilled workforce. Skill shortages may be qualitative (skill gaps) and/or quantitative (labour shortage). There are several factors that cause skill shortages in LDCs:

- Unbalanced national skills structures, with very small numbers of university graduates and well-trained skilled

⁴ WHO and UNDP, 2009. *The Energy Access Situation in Developing Countries*.

⁵ UNESCO, 2012. *Education for all. Youth and Skills - Putting education to work*.

manual workers relative to the total workforce. This disproportion hinders upskilling efforts.

- Lack of basic STEM (science, technology, engineering and mathematics) skills, which are essential to foster the innovation and business skills that help to create feasible local solutions for new economic activities and sectors.
- A training system which is not sufficiently responsive to changes in the economy. A lack of dialogue among social partners, outdated curricula, inflexible training delivery, and training providers that are too few, under-resourced and insufficiently linked with the private sector all contribute to a mismatch between skills supply and demand.
- A shortage of qualified teachers and trainers specializing in green areas such as renewable energy, sustainable housing, energy-efficient appliances or environmental awareness, which limits the relevant programmes training providers can offer.
- Underestimation of growth in some sectors, such as waste recycling, so that training systems cannot respond to new skills demands in a timely manner.
- Failure on the part of some companies in sectors experiencing workforce shortages to attract skilled workers even where they are available, owing to poor working conditions.
- The loss of skilled workers and teachers to other countries. However, training is only part of the solution to this “brain drain”; low salaries and poor working conditions also need to be addressed to reverse this trend.
- Lack of good labour market information on future skills demand and/or institutional frameworks conducive to effective dialogue on relevant training. Some countries deal with this problem by conducting one-off surveys targeted at enterprises in a specific sector, but a more systematic approach could provide better results.

In Uganda, for instance, the renewable energy sector lacks workers qualified at medium and high-skilled level for solar panel assembly and biofuel production. LDCs also lack specialized professionals such as the environmental scientists required to assess the sustainability of projects under the Clean Development Mechanism, introduced by the Kyoto Protocol in 1997 to encourage project-based emissions reduction activities in developing countries.

Challenge 3: Skills and environmental policies need to come together

Environmental or climate change related policies have created incentives for investment, but only a few set out the skills development measures needed to implement the policies. This gap is often the result of weak coordination with labour and education ministries, although the dual challenge of inadequate resources and low institutional capacity for programme implementation also holds down demand for skills for green jobs. Increased inter-ministerial

coordination could lead to significantly increased demand for these skills in LDCs.

Some NAPAs adopted by LDCs refer to skills-related measures in water resource management, techniques for sustainable land management, restoration of soil fertility and extension of hydro-agro-meteorological services to crop and livestock farmers. In Mali, for example, the development of an adaptation training package for rural communities is included in the NAPA. Whether it will be successfully implemented largely depends on efficient inter-ministerial coordination, collaboration between training providers and the private sector, provision of capacity development measures and availability of resources.

Challenge 4: Workers in informal and rural economies lack opportunities to upgrade skills

The informal economy accounts for a very large percentage of employment in most LDCs, presenting a particular challenge to disseminating skills for green jobs. With rapid demographic growth making large cohorts of young people available for the labour market, and formal sector employment expanding too slowly to accommodate them, many have little choice but to take work in the informal economy. In Lesotho, roughly 50 per cent of the non-agricultural labour force works in the informal economy; in Uganda and Zambia the figures approach 70 per cent (KILM, ILO, 2011). This means high proportions of low-skilled workers trapped in low-productivity jobs, especially in rural areas.

While progress has been made in increasing access to good quality education and training to people in rural areas and those working in the informal economy, such access remains severely limited, for reasons relating to cost (of training and transportation), non-financial factors (e.g. poor infrastructure and inflexible training schedules) and entry requirements above those that most would-be participants can meet.

Although informal apprenticeship is an important way of acquiring technical and vocational skills on the job, if it is to do more than reproduce low-productivity jobs the system needs to be upgraded through such means as training master craftspeople, improving recognition of acquired skills and creating links to formal education.

Agriculture is the primary motor for LDC economies and employs large majorities of many national workforces, mainly in an informal setting and at subsistence level. In Mali, for example, 83 per cent of the workforce is involved in agriculture, livestock and fisheries for some or all of their income. Experience from different countries shows that change in farming skills is usually driven by changing environmental conditions such as climate change, soil degradation and desertification. However, agricultural extension services that provide support and can impart new skills and techniques often do not reach out to remote areas where they are acutely needed.

Box 3. As occupations evolve, new sets of skills are required

In the transition to greener economies, skills and occupations will be affected in different ways:

- a. **Some occupations will not change at all, but demand for them will change:** for example, if a government expands protected areas of territory to promote eco-tourism (see box 4), more national park rangers will be needed.
- b. **Some established occupations will require new ways of working and thus skill upgrades.** These will outnumber by far new occupations. For instance, some plumbers will require additional skills to install and provide maintenance for solar water heaters.
- c. **Where new occupations are created they often call for higher-level qualifications,** either because of their

dependence on new technologies, or because they call for specific “soft” skills such as networking, organizational or consultancy capabilities.

- d. **Some jobs will disappear as the economy becomes greener.** For instance, extractive industries or high carbon-emitting manufacturing may contract. Many of the skills used in the jobs lost in this process can be used in new green jobs, but this shift will require concentrated attention to retraining to minimize the economic and social costs of restructuring and enable displaced workers to tap new job opportunities.

The training response should be adapted to these varying degrees of occupational change:

Degree of skill change	Occupational change	Typical skills response	Examples
None	No change in skills; quantitative change in demand	None or increased training in existing occupation	National park ranger, bus driver
Low	Changing occupation	On-the-job learning or short training courses	Organic farmer, tourist guide in eco-tourism
Medium	Changing or emerging occupation	Short courses or longer continuous training	Plumber installing solar water heaters, bricklayer building biogas digesters
High	Emerging occupation	Initial training, university degree or longer continuous training	Solar energy technician, carbon consultant, architects, and agricultural engineers

Source: UNEP et al. (2008); Strietska - Iliina et al. (2011).

Greening LDC economies: boosting skills to create jobs

Policy message 1: Coordinate skills development with environmental, economic and social concerns in national development policies

Where market mechanisms are weak, as they are in most developing countries, the development of green jobs is driven by policy and regulation. Many LDCs have formulated strategies to adapt to climate change, and nearly all have adopted NAPAs that aim to strengthen the capacity of agricultural producers to cope with drought conditions and to manage water resources sustainably. Other environment-related policies regulate the use or import of hazardous liquids or ozone-depleting substances, or the processing of e-waste. Successful implementation of these policies and regulations requires corresponding skills development measures.

Skills issues can be effectively integrated into sustainable development policies, and social partners included in the design and implementation of these policies, by setting up task forces to address the human resources aspects of sustainable development, incorporating responsibility for training and skills into a sustainable development council, or including this function in

the remit of an existing structure. It is important that whatever form such bodies take, they also have decision-making authority, and can establish clear commitments among the parties concerned, including the allocation of adequate human and financial resources.

More coordination does not mean more centralization; indeed, a more decentralized approach can be more conducive to policy coordination and coherence at sectoral, regional or local levels. Many LDCs have developed national strategies for sustainable development, and councils for sustainable development to coordinate their implementation, at national and sometimes subnational levels. To support these arrangements, it is essential that technical skills and environmental awareness are mainstreamed and fully integrated in their operation through capacity development and training measures.

An example of a coordinated approach in the elaboration of a national skills strategy on climate change is the UN CC:Learn initiative (see box 5).

Policy message 2: Coordinate investments in jobs and skills

Labour-intensive investments have proved effective in many LDCs, for example to improve infrastructure and housing using locally available resources, or to restore ecosystems through

soil restoration or afforestation. These investments need to go hand in hand with training and retraining measures to improve workers' employability and equip them with transferable skills, and thereby to prevent both job losses and skill shortages.

Many energy efficiency building projects and other new construction enterprises in LDCs are held back by a shortage of the required skills. This obstacle can be overcome by including energy and resource efficiency components in vocational training and retraining programmes. Infrastructure development could go hand in hand with investment in public transportation – a sector with huge potential which is severely underdeveloped in LDCs.

There are also major opportunities to exploit renewable energy, the key challenge here being to maximize the local economic benefits of these developments. Although initially it may be necessary to bring in skilled workers from outside the country, it should be possible as projects develop to reduce reliance on international expertise. In many cases, installation of renewable electricity generating capacity in developing countries will offer new opportunities to rural and isolated communities, giving them the chance to establish new businesses and services (see box 8). Ideally, such initiatives will be linked with complementary training and financing measures, including entrepreneurship training and access to micro-credit and business support services.

Policy message 3: Match skill supply to labour market demand better through social dialogue, information and core skills

There is an urgent need in LDCs to close the gap between the quality and quantity of available skills on the one hand and the demand for the skills required in the green transition on the other. This gap can only be closed through coordinated measures, including:

- setting up mechanisms, such as national and/or sectoral skills councils, to facilitate better policy coordination, social dialogue and exchange of information on skills demand between the private sector, government and training providers;
- strengthening the capacity of trade unions and employers' associations and bringing them into the planning, design and implementation of training programmes, while also allowing the private sector to inform skills development and thereby contribute to better matching supply and demand;
- fostering social dialogue to promote a comprehensive approach to human resource development that links training measures to the broader strategic objectives of industries, businesses and governments, continuously improves working conditions and workers' protection, and thereby inhibits the outflow of skills to competitors or abroad;
- developing labour market information and analysis with the aim of more accurately identifying the current and

Box 4. Eco-tourism in Lao People's Democratic Republic

Eco-tourism is developing in many countries as tourists demand services that do not harm the environment. Many smaller, specialized operators are emerging and have created a vibrant market. Governments play a role in the push for more sustainable tourism as natural resources needed for tourism require special protection. The growth of eco-tourism calls for tourist guides, hotel managers, resort operators, souvenir shop assistants, clerks in tourist offices among others to know about environmental concerns and be able to incorporate issues such as biodiversity, forest rehabilitation and climate change into their daily business. On-the-job training adds skills to existing occupational profiles.

In the Lao People's Democratic Republic eco-tourism is promoted through the Government's National Eco-tourism Strategy and Action Plan, which aims to foster eco-tourism, supporting training and capacity building, environmental protection and socio-economic development for host communities. Its training component aims at establishing a mobile training unit under the auspices of the Lao National Tourism Administration to coordinate and develop standardized training programmes and manuals for key groups, including training for tour guides; eco-tourism awareness programmes for national and local government staff and local communities; eco-tourism business skills for guest house and lodge owners; and specific eco-tourism planning and management courses for national and local government officers. The development of vocational, diploma and bachelor's degree courses in the eco-tourism, tourism and hospitality sectors is supported by the Government.

Sources: Strietska-Illina et al., 2011; Lao National Tourism Administration, 2005. National Ecotourism Strategy and Action Plan; International Union for Conservation of Nature, 2012. Integrating business skills into ecotourism operations.

future demand for skills, including those required for overall capacity building;

- using "soft" analytical methods, such as case studies, focus groups, employer surveys and analysis of job advertisements, to anticipate the demand for skills for green jobs; and
- promoting core skills, such as leadership, entrepreneurship, teamwork, systemic thinking, communication and knowledge of foreign languages, to help workers to adjust to change and make them better employable throughout many occupations, industries and territories.

Box 5. UN CC: Learn – National strategies to promote skills for climate-resilient development

The One UN Training Service Platform on Climate Change (UN CC:Learn) is a collaborative initiative involving 33 multilateral organizations. It supports member States, UN agencies and other development partners in designing and implementing country-driven, results-oriented and sustainable learning to address climate change. At country level, UN CC:Learn is piloting a methodology to assist countries in reviewing existing institutional and individual capacities to advance green, low-emission and climate-resilient development and identifying action to strengthen related capacities.

Benin, one of the five pilot countries, has established a multisectoral and multistakeholder National Coordinating Mechanism, hosted by the Ministry of Environment, Housing and Urbanism (MEHU). The development of the “National Strategy to Strengthen Human Resources and Skills to Advance Green, Low-Emission and Climate-Resilient Development” has benefited from background research and an extensive consultative process. The strategy identifies as priority actions the strengthening of individual skills and institutional capacities in agriculture, water, energy, forestry, health and coastal management.

Another pilot country, Malawi, has already launched its Climate Change Learning Strategy. Implementation has begun with production and field testing of teaching aids in schools, and specific training on climate change delivered to 200 frontline forestry extension workers and 200 health surveillance staff.

Source: UN CC:Learn at <http://www.uncclearn.org/>.

Policy message 4: Boost the productivity and sustainability of farming through better skills

One of the greatest challenges to the development of the labour-intensive agricultural sector in many LDCs is low productivity (see box 2), with yields per hectare in African countries, for example, averaging only 1.3 tons – less than half the world average. Improved agriculture extension services and other means of outreach can help raise both soil and labour productivity by demonstrating more productive and sustainable farming methods, including soil management, efficient use of fertilizers and water irrigation systems.

In order to increase resilience to climate shocks such as drought or flood, farmers require new techniques and skills, including knowledge of how to cultivate varieties or species of crops that will thrive in changing conditions. Diversifying into vegetables and fruits, adding value to production by processing local raw materials, small-scale commerce, animal husbandry, energy crop farming, tree planning and tree nurseries can all be viable alternatives to traditional crop production. Mobile training units and extension practices that take training out into remote areas are needed

Box 6. Sustainable construction and employment for young people in Sudan

In programmes for the re-employment of internally displaced persons, social housing is built using stabilized soil blocks (SSB), both providing new homes and offering community members an opportunity to earn an income while also receiving training in SSB construction. SSBs are made of a mix of silt and clay soil with only 5 per cent cement. They use 60 per cent less water than any other types of brick. The materials – clay, sand and water – are locally available, they cost less than cement, and they contribute to reducing the use of wood for construction and the associated deforestation. UN-Habitat has worked closely with local authorities, technical institutes and schools to include SSB construction in their curricula, and with state ministries to include it in their construction codes and standards.

Source: UN-Habitat, 2012. *Economic Benefits of Stabilized Soil Block Technology in Sudan*.

Policy message 5: Prioritize training and entrepreneurship opportunities for disadvantaged groups

The greening of the economy will yield its full growth dividend only if training is gender sensitive and accessible to vulnerable groups, including disadvantaged youth, workers in the informal economy, people with disabilities and those in rural communities.

In the informal economy, where safety standards and wage levels are often insufficient, attention needs to be given not only to how green jobs are, but to whether they offer decent work. Building on existing skills delivery systems such as informal apprenticeship is more cost-effective than investing in expensive new training infrastructure that might offer merely centre-based training without involving local employers, especially micro and small businesses.

Small-scale community-based projects can successfully target rural and disadvantaged groups and provide access to additional sources of income. In Benin and Burkina Faso, for example, an ILO-supported project trains young people in bee-keeping and creates jobs in eco-friendly bee-keeping initiatives. The approach is based on the TREE training methodology⁶ for rural economic empowerment and helps young people to make use of new income-earning opportunities.

Given that newly emerging occupations are not burdened by a history of gender stereotyping and segregation, they offer a unique opportunity to break existing gender barriers. Incentives to increase women’s participation in green work, notably through technical and vocational training programmes, will achieve the double objective of addressing skill shortage pro-

⁶ The Training for Rural Economic Empowerment (TREE) methodology is an ILO tool designed to identify opportunities for emerging and potential employment, income generation and small business development and to deliver training in practical skills and business management.



blems in this area and also increasing women's participation in technology-driven occupations (see box 8).

Policy message 6: Use peer learning to spread sustainable practices and use of new green technologies

Technology transfer, knowledge sharing and joint training approaches are essential to create opportunities for LDCs to manufacture, install and maintain up-to-date environment-friendly technology, for example in the renewable energy sector. South–South cooperation has an important role to play here. Over 50 per cent of the energy LDCs consume is used for cooking, highlighting the importance of improved (smokeless and fuel-conserving) stoves for cooking and heating. Bangladesh, China and India, where efficient stoves have already been deployed, have the opportunity to disseminate such technologies to other developing countries. Many local institutions can contribute to the adoption of such appropriate technologies. For example, AFREPREN/FWD is an NGO based in Kenya that fosters exchange of information and expertise between energy practitioners, professionals, researchers, investors and policy-makers in African countries, including LDCs, who have a long-term interest in the development of cleaner energy services for Africa, through avenues including research, capacity building and policy-making.

The market potential of green innovation, as well as the application of new green technologies, encourages companies to develop the skills needed to exploit new methods of working. Social innovation, as well as innovation in hard technologies, is crucial to the green transition, particularly in LDCs. Innovation in knowledge-sharing and communication processes can help to form networks of institutions and individuals whose activities and interactions initiate, import, adapt and allow the adoption of new technologies, management systems and incentive mechanisms.

LDCs need to capitalize on the existing skills of their populations, who have often followed sustainable patterns of natural resource use. Uganda, for example, has converted small-scale farming into organic farms supplying world markets, thereby becoming one of the countries with the largest number of organic farmers. There is great potential for such examples of success to be emulated by other developing countries facing similar challenges.

Box 7. Organic coffee production in Ethiopia

The Oromia Coffee Farmers' Cooperative Union (OCFCU) brings together smallholder coffee growers. Established in 1999 by 34 cooperatives with 22,691 farmers, the cooperative today comprises 197 individual cooperatives with a total of over 200,000 members. Oromia's mission is to support small producers in becoming economically self-sufficient and to ensure household food security. Training and counselling are provided on supporting biodiversity, enhancing soil health through the use of organic compost and promoting environmental protection. Oromia's coffee is organic and forest-grown, and no herbicides, insecticides or chemical fertilizers are used in its production. Harvesting is carried out by hand. Supervision and inspection are undertaken once a year by BCS Öko-Garantie, a private agency implementing EU regulations on organic production.

Source: ILO, 2008.

Policy message 7: Mobilize highly skilled nationals in the diaspora to contribute to green transitions

More and more people with university-level education emigrate from LDCs. This overseas pool of highly skilled individuals can be mobilized to share knowledge, contribute to R&D, and engage in joint ventures and alliances for the development and transfer of technology, including green technology, thereby contributing to national development in the home country. Such contributions to skills development may be made through e-communication in online networks, or temporary or permanent return. Best use of this resource requires adequate institutional support and policy frameworks, such as the Ethiopian Expatriate Affairs Department of the Ministry of Foreign Affairs or the Senegalese Diaspora Foundation.

Policy message 8: Enable teachers and trainers to keep skills for green jobs up-to-date

The availability of teachers and trainers with current knowledge on green technologies and sustainable development issues is crucial for the success of the green transition. Their role in LDCs includes but goes far beyond promoting environmental

Box 8. Solar home systems in Bangladesh

Almost half of the population of Bangladesh – some 85 million people – lack access to grid-based electricity. In this context, the installation of photovoltaic off-grid electricity systems in rural areas has been a notable success story. Approximately 1.2 million solar home systems (SHS), particularly suitable for remote, inaccessible areas, had been installed by the end of 2011. These systems are used for lighting, charging mobile phones, and running televisions and radios. About 60,000 people are employed along the SHS supply chain in Bangladesh, and additional jobs are created indirectly in new businesses such as community TV shops, solar-charged mobile phone centres and electronics repair shops.

While new jobs in the renewable energy sector are on the rise in Bangladesh, efforts must be made to ensure that these jobs provide pathways to sustainable employment through productive and decent work. Grameen Shakti successfully promotes and implements a unique approach involving credit for consumers (microfinance), the transfer of adaptive technology at low cost and the provision of training targeted especially at young people and women. Today GS covers 60 per cent of the SHS market and provides electricity to 650,000 rural households.

The ILO works with Grameen Shakti to mainstream the training developed into the formal TVET system by improving curricula and competency standards on the installation and maintenance of SHS. The target beneficiaries are the unemployed in ten rural districts. The curriculum includes modules on occupational safety and health (OSH) and labour standards.



Sources: ILO, 2012. *Green Jobs in Asia Project, Employment Creation Model in Bangladesh, Dhaka*; IRENA, 2012. *Renewable Energy - Jobs and Access*; Grameen Shakti (<http://www.gshakti.org>).

Photo: Courtesy of Grameen Shakti.

Box 9. Teacher and trainer training in renewable energies in Mozambique

Teacher training has been a key component in the establishment of the first Mozambique photovoltaic laboratory at the Instituto Industrial de Maputo. In this laboratory, future technicians are trained in the installation and maintenance of photovoltaic solar panels. Recently 24 vocational teachers and technicians from other relevant institutions were trained as trainers in a three-month training course on renewable energies with the support of GIZ. The in-depth training course on solar energy included both technical and pedagogical content, focusing on conversion of electrical systems and renewable energy supply. This has become a frame of reference for a good quality and practice oriented training programme. The laboratory is used not only as a training centre for students, but also as a site for solar technology qualification for technicians in the private sector.

Source: GIZ, 2013. *TVET for a Green Economy, (Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH*.

awareness and carrying out technical training among young people within the formal education and training system; it extends to spreading environment-related training out into rural communities, to disadvantaged groups and throughout the adult population. The education and training of such teachers and trainers should therefore be a top priority in any skills strategy for greener economies.

Policy message 9: Use skills development to promote green change by raising awareness

Every day green practices are in the hands of individuals, leaders and company managers. Cultural inertia, habit and a fear of high economic costs all hamper the transition to a greener economy. Embarking on a greener path is only possible if mindsets are changed and current polluting practices are abandoned. This in turn can be achieved only through informing people about green solutions in everyday life and work, and increasing general environmental awareness. Recycling and resource-saving practices, green solutions to local problems, greener use of materials and environmental awareness should become integral elements of all education and training processes.

Social dialogue can also help raise environmental awareness at company and industry levels. While businesses in low-income countries might be unable to introduce new and eco-friendly technologies with high upfront costs, they might be willing to support the inclusion of environmental awareness into training programmes to improve energy and resource efficiency and the management of water and waste in production processes. Developing the capabilities of industries and enterprises, including small and micro-enterprises, is crucial to transition to



energy- and resource-efficient practices, and greener products and services. For instance, training and capacity development efforts could target chambers of commerce or investment authorities, which could reach out to the private sector at different levels.

Concluding observations

A great deal is at stake for LDCs confronting the green transition. Sticking to business-as-usual practices may exact severe social and economic costs; by contrast, opting for sustainable development and greener jobs offers the potential for new job opportunities and inclusive growth. External factors related to a changing environment, as well as internal factors – such as the need for energy supply in rural areas, the need for new income-generating opportunities in struggling sectors as traditional fishery or agriculture and the prospect of business opportunities in new markets, with the related employment potential – all act as driving forces for change.

These drivers are particularly important for LDCs as the productive sectors most vital to their economies are dependent on natural resources and vulnerable to environmental change. At the same time, responses to emerging challenges can offer new opportunities for sustained economic growth and the creation of decent work, with a concomitant reduction in poverty. For that to happen, LDCs need to capitalize on their natural capital assets, while also addressing the key constraints of inadequate skills and human capacity.

Policy-makers and representatives of businesses and workers need to come together to plan skills development processes in order to seize the opportunities offered by the green transition. In doing so, they could usefully consider the recommendations of this policy brief regarding:

- stakeholder coordination in policy and implementation stages,
- the anticipation of skill needs,

Box 10. Promoting youth entrepreneurship in green ventures

The Youth Entrepreneurship Facility (YEF) is a five-year programme financially supported by the Government of Denmark through the Africa Commission. YEF provides financial and technical support for young men and women in Kenya, Tanzania and Uganda, helping them to turn their creativity, energy and ideas into business opportunities, including in green sectors.

By providing youth entrepreneurs with training in the Generate Your Business Idea (GYBI) and Start Your Business (SYB) programmes, along with some financial support, YEF seeks to help young African entrepreneurs in these three countries to establish 11,000 new businesses and create at least 23,000 new jobs. In a 2011 competition, 31 student companies out of 73 (43 per cent) created green businesses.

In Benin and Zimbabwe, the ILO Danish-funded project on Skills for Youth Employment and Rural Development assisted local communities in expanding honey production through training on bee hive construction using locally sourced scrap wood. Beekeeping is an ecologically and technically appropriate form of a life-sustaining source of green jobs and incomes for many out of the school youth in some of the poorest rural areas. Young people benefiting from the Training for Rural Economic Empowerment programme are changing from traditional practice and techniques using beehives made from tree trunks to more productive skills to meet the local and regional demand for good quality organic honey using environmentally friendly beehives made from waste timber from local saw mill and carpentry plants.

Source: Youth Entrepreneurship Facility (<http://www.yef africa.org/>); ILO Skills and Employability Branch.

- social dialogue,
- teacher training, and
- the provision of training for disadvantaged groups.

The development of policies on skills for green jobs requires both financial and human resources. This has to be acknowledged in the support mechanisms offered by development partners. Development partners and international organizations need to address LDCs' requests for funding and for capacity development at both policy and implementation levels, taking skills development for green jobs fully into account as a cross-cutting issue in development cooperation interventions. In addition, the development of new markets, essential for seizing job creation opportunities, requires technology transfer in South–South as well as North–South partnerships.

Key ILO resources

- ILO, 2013a. *Sustainable development, decent work and green jobs*, Report V, International Labour Conference, 102nd Session (ILO, Geneva).
- . 2013b. Conclusions of the Committee on Sustainable development, decent work and green jobs (Provisional Record 12, Fifth item on the agenda: Sustainable development, decent work and green jobs), International Labour Conference, 102nd Session, (ILO, Geneva).
- . 2013c. Meeting skills needs for green jobs: Policy Recommendations, Inter-Agency Working Group (IWG) on Greening Technical and Vocational Education and Training and Skills Development (ILO, Geneva).
- . Forthcoming 2014. Practical guide on anticipating skill needs for green jobs (ILO, Geneva).
- . 2012. *Working towards sustainable development* (ILO, Geneva).
- . 2011a. *Comparative analysis of methods of identification of skill needs on the labour market in transition to the low carbon economy* (ILO, Geneva).
- . 2011b. *Growth, productive employment and decent work in the least developed countries*, Report of the ILO for the Fourth UN Conference of the LDCs, 9–13 May 2011, Turkey (ILO, Geneva).
- . 2011c. *Skills and occupational needs in renewable energy* (Geneva).
- . 2011d. *Skills and occupational needs in green building* (Geneva).
- . 2011e. *Greening the global economy: the skills challenge*, Skills for Employment Policy Brief (ILO, Geneva).
- . 2010. *A skilled workforce for strong, balanced and sustainable growth: A G20 training strategy* (Geneva).
- . 2008. *Conclusions on skills for improved productivity, employment, growth and development*, International Labour Conference, 97th Session (ILO, Geneva).
- . 2004. *Human Resources Development Recommendation* (No. 195).
- Strietska-Ilina, O.; Hofmann, C.; Duran, M.; Jeon, S. 2011. *Skills for green jobs. A global view. Synthesis report based on 21 country studies* (ILO, Geneva).
- Skills for Green Jobs – 21 background country studies* (Cedefop, ILO).
- UNEP/ILO/ITUC/IOE. 2008. *Green Jobs: Towards decent work in a sustainable, low-carbon world*.
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For more information on links between education and training and productive and decent work, visit the **Global Public–Private Knowledge Sharing Platform on Skills for Employment**, initiated by the ILO and benefiting from the support and collaboration of the Organisation for Economic Co-operation and Development (OECD), the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the World Bank.
<http://www.skillsforemployment.org/KSP/en/index.htm>

Further information:

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