



GLOBAL EDUCATION MONITORING REPORT

2016

Partnering for Prosperity:

EDUCATION FOR GREEN AND INCLUSIVE GROWTH



United Nations
Educational, Scientific and
Cultural Organization



Sustainable
Development
Goals



Global
Education
Monitoring
Report

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Cultural Organization

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This publication contains the Prosperity and Partnership chapters and the policy recommendations from the 2016 *Global Education Monitoring Report* (GEM Report). It also includes a chapter from the Gender Review of the 2016 GEM Report, looking at the links between education, gender and work. The full report also includes chapters on Planet: environmental sustainability; People: inclusive social development; Peace: political participation, peace and access to justice; Place: inclusive and sustainable cities; Projection of global education trends; and numerous chapters on monitoring education in the 2030 Agenda for Sustainable Development.

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Foreword

In May 2015, the World Education Forum in Incheon (Republic of Korea), brought together 1,600 participants from 160 countries with a single goal in mind: how to ensure inclusive and equitable quality education and lifelong learning for all by 2030?

The Incheon Declaration for Education 2030 has been instrumental to shape the Sustainable Development Goal on Education to “Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all”.

It entrusts UNESCO with the leadership, coordination and monitoring of the Education 2030 agenda. It also calls upon the Global Education Monitoring (GEM) Report to provide independent monitoring and reporting of the Sustainable Development Goal on education (SDG 4), and on education in the other SDGs, for the next fifteen years.

The ultimate goal of this agenda is to leave no one behind. This calls for robust data and sound monitoring. The 2016 edition of the GEM Report provides valuable insight for governments and policy makers to monitor and accelerate progress towards SDG 4, building on the indicators and targets we have, with equity and inclusion as measures of overall success.

This Report makes three messages starkly clear.

Firstly, the urgent need for new approaches. On current trends only 70% of children in low income countries will complete primary school in 2030, a goal that should have been achieved in 2015. We need the political will, the policies, the innovation and the resources to buck this trend.

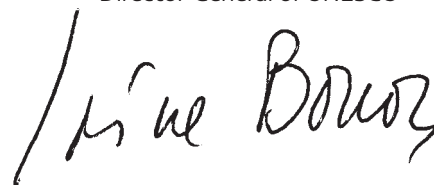
Secondly, if we are serious about SDG 4, we must act with a sense of heightened urgency, and with long-term commitment. Failure to do so will not only adversely affect education but will hamper progress towards each and every development goal: poverty reduction, hunger eradication, improved health, gender equality and women’s empowerment, sustainable production and consumption, resilient cities, and more equal and inclusive societies.

Lastly, we must fundamentally change the way we think about education and its role in human well-being and global development. Now, more than ever, education has a responsibility to foster the right type of skills, attitudes and behavior that will lead to sustainable and inclusive growth.

The 2030 Agenda for Sustainable Development calls on us to develop holistic and integrated responses to the many social, economic and environmental challenges we face. This means reaching out beyond traditional boundaries and creating effective, cross-sectoral partnerships.

A sustainable future for all is about human dignity, social inclusion and environmental protection. It is a future where economic growth does not exacerbate inequalities but builds prosperity for all; where urban areas and labour markets are designed to empower everyone and economic activities, communal and corporate, are green-oriented. Sustainable development is a belief that human development cannot happen without a healthy planet. Embarking upon the new SDG agenda requires all of us to reflect upon the ultimate purpose of learning throughout life. Because, if done right, education has the power like none else to nurture empowered, reflective, engaged and skilled citizens who can chart the way towards a safer, greener and fairer planet for all. This new report provides relevant evidence to enrich these discussions and craft the policies needed to make it a reality for all.

Irina Bokova
Director-General of UNESCO



Foreword

The 2016 Global Education Monitoring Report (GEM Report) is both masterful and disquieting. This is a big report: comprehensive, in-depth and perspicacious. It is also an unnerving report. It establishes that education is at the heart of sustainable development and the Sustainable Development Goals (SDGs), yet it also makes clear just how far away we are from achieving the SDGs. This report should set off alarm bells around the world and lead to a historic scale-up of actions to achieve SDG 4.

The GEM Report provides an authoritative account of how education is the most vital input for every dimension of sustainable development. Better education leads to greater prosperity, improved agriculture, better health outcomes, less violence, more gender equality, higher social capital and an improved natural environment. Education is key to helping people around the world understand why sustainable development is such a vital concept for our common future. Education gives us the key tools – economic, social, technological, even ethical – to take on the SDGs and to achieve them. These facts are spelled out in exquisite and unusual detail throughout the report. There is a wealth of information to be mined in the tables, graphs and texts.

Yet the report also emphasizes the remarkable gaps between where the world stands today on education and where it has promised to arrive as of 2030. The gaps in educational attainment between rich and poor, within and between countries, are simply appalling. In many poor countries, poor children face nearly insurmountable obstacles under current conditions. They lack books at home; have no opportunity for pre-primary school; and enter facilities without electricity, water, hygiene, qualified teachers, textbooks and the other appurtenances of a basic education, much less a quality education. The implications are staggering. While SDG 4 calls for universal completion of upper secondary education by 2030, the current completion rate in low-income countries is a meagre 14% (Table 10.3 of the full report).

The GEM Report undertakes an important exercise to determine how many countries will reach the 2030 target on the current trajectory, or even on a path that matches the fastest improving country in the region. The answer is sobering: we need unprecedented progress, starting almost immediately, in order to have a shot at success with SDG 4.

Cynics might say, 'We told you, SDG 4 is simply unachievable', and suggest that we accept that 'reality'. Yet as the report hammers home in countless ways, such complacency is reckless and immoral. If we leave the current young generation without adequate schooling, we doom them and the world to future poverty, environmental ills, and even social violence and instability for decades to come. There can be no excuse for complacency. The message of this report is that we need to get our act together to accelerate educational attainment in an unprecedented manner.

One of the keys for acceleration is financing. Here again, the report makes for sobering reading. Development aid for education today is lower than it was in 2009 (Figure 20.7 of the full report). This is staggeringly short-sighted of the rich countries. Do these donor countries really believe that they are 'saving money' by underinvesting in aid for education in the world's low-income countries? After reading this report, the leaders and citizens in the high income world will be deeply aware that investing in education is fundamental for global well-being, and that the current level of aid, at around US\$5 billion per year for primary education – just US\$5 per person per year in the rich countries! – is a tragically small investment for the world's future sustainable development and peace.

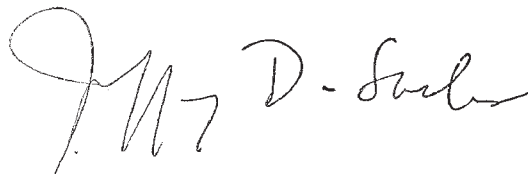
The 2016 GEM Report provides a plethora of insights, recommendations and standards for moving forward. It offers invaluable suggestions on how to monitor and measure progress on SDG 4. It demonstrates by example the feasibility of far more refined measures of education inputs, quality and achievement than the often crude measures of enrolment and completion that we rely on today. Using big data, better survey tools, facility monitoring and information technology, we can get far more nuanced measures of the education process and outcomes at all levels.

Fifteen years ago the world finally recognized the enormity of the AIDS epidemic and other health emergencies and took concrete steps to scale up public health interventions in the context of the Millennium Development Goals. Thus were born major initiatives such as the Global Fund to Fight AIDS, Tuberculosis and Malaria, the Global Alliance for Vaccines and Immunisation (now Gavi, the Vaccine Alliance) and many other examples. These efforts led to a dramatic upturn in public health interventions and funding. While it did not achieve all that was possible (mainly because the 2008 financial crisis ended the upswing in public health funding) it did lead to many breakthroughs whose effects continue to be felt today.

The 2016 GEM Report should be read as a similar call to action for education as the core of the SDGs. My own view, often repeated in the past couple of years, is the urgency of a Global Fund for Education that builds on the positive lessons of the Global Fund for AIDS, Tuberculosis and Malaria. The financing constraint lies at the very heart of the education challenge, as this report makes vividly clear through every bit of cross-national and household-based data.

This compelling document calls on us to respond to the opportunity, urgency and declared global goal embodied in SDG 4: universal education of good quality for all and opportunities for learning throughout life. I urge people everywhere to study this report carefully and take its essential messages to heart. Most importantly, let us act on them at every level, from the local community to the global community.

Jeffrey D. Sachs
Special Adviser to the UN Secretary-General on the
Sustainable Development Goals

A handwritten signature in black ink, reading "J. D. Sachs". The signature is fluid and cursive, with the first name "J." and last name "Sachs" clearly legible, and "D." in the middle.

Introduction

EDUCATION WITHIN SUSTAINABLE DEVELOPMENT

The 2030 Agenda for Sustainable Development unites global development goals in one framework. The fourth global goal on education (SDG4) succeeds the Millennium Development Goal and Education for All priorities for education. At the World Education Forum in Incheon, Republic of Korea, in May 2015, representatives of the global education community signed the Incheon Declaration, embracing the proposed SDG 4 as the single universal education goal, which commits countries to '[e]nsure inclusive and equitable quality education and promote lifelong learning opportunities for all'. SDG 4 and its 10 targets advance a model where learning, in all its shapes and forms, has the power to influence people's choices to create more just, peaceful, inclusive and sustainable societies. To provide a clear blueprint for implementing SDG4, the international education community adopted the Education 2030 Framework for Action in Paris in November 2015 (UNESCO, 2015a).

Education within the sustainable development agenda is founded on principles drawn from a rich history of international instruments and agreements. These principles state that education is both a fundamental human right and an enabling right, i.e. it enables other human rights; that it is a public good and a shared societal endeavour, which implies an inclusive process of public policy formulation and implementation; and that gender equality is inextricably linked to the right to education for all (UNESCO, 2015a). These principles are inspired by a humanistic vision of education and development based on human rights and dignity, justice and shared responsibility.

EDUCATION IS INTERLINKED WITH OTHER SDGS

The SDGs, targets and means of implementation are thought of as universal, indivisible and interlinked. Each of the 17 goals has a set of targets. In each set, at least one target involves learning, training, educating or at the very least raising awareness of core sustainable development issues. Education has long been recognized as a critical factor in addressing environmental and sustainability issues and ensuring human well-being. (Table 0.1)

TABLE 0.1:
How education is typically linked with other Sustainable Development Goals

Goal 1	Education is critical to lifting people out of poverty.	Goal 10	Where equally accessible, education makes a proven difference to social and economic inequality.
Goal 2	Education plays a key role in helping people move towards more sustainable farming methods, and in understanding nutrition.	Goal 11	Education can give people the skills to participate in shaping and maintaining more sustainable cities, and to achieve resilience in disaster situations.
Goal 3	Education can make a critical difference to a range of health issues, including early mortality, reproductive health, spread of disease, healthy lifestyles and well-being.	Goal 12	Education can make a critical difference to production patterns (e.g. with regard to the circular economy) and to consumer understanding of more sustainably produced goods and prevention of waste.
Goal 5	Education for women and girls is particularly important to achieve basic literacy, improve participative skills and abilities, and improve life chances.	Goal 13	Education is key to mass understanding of the impact of climate change and to adaptation and mitigation, particularly at the local level.
Goal 6	Education and training increase skills and the capacity to use natural resources more sustainably and can promote hygiene.	Goal 14	Education is important in developing awareness of the marine environment and building proactive consensus regarding wise and sustainable use.
Goal 7	Educational programmes, particularly non-formal and informal, can promote better energy conservation and uptake of renewable energy sources.	Goal 15	Education and training increase skills and capacity to underpin sustainable livelihoods and to conserve natural resources and biodiversity, particularly in threatened environments.
Goal 8	There is a direct link among such areas as economic vitality, entrepreneurship, job market skills and levels of education.	Goal 16	Social learning is vital to facilitate and ensure participative, inclusive and just societies, as well as social coherence.
Goal 9	Education is necessary to develop the skills required to build more resilient infrastructure and more sustainable industrialization.	Goal 17	Lifelong learning builds capacity to understand and promote sustainable development policies and practices.

Source: ICSU and ISSC (2015).

WHAT KIND OF EDUCATION IS NECESSARY?

It is taken for granted that education of good quality can help develop citizens who are capable and mindful, which in turn improves their livelihoods and those of others around them. But the Incheon Declaration makes clear that certain knowledge, skills and values promote sustainable development more than others. Not all education brings the same benefits to everyone. Time, place, situation and context matter (Harber, 2014).

Some scholars suggest that education systems that focus on preparing young people for a lifetime of work and consumption to serve mainly economic ends have adverse effects (Nussbaum, 2010; Orr, 1994). They argue that without critical reflection on the strengths, weaknesses and ultimate purpose of learning, education systems risk becoming an extension of an unsustainable globalizing economy. This concern is powerfully expressed by John Evans, General Secretary of the Trade Union Advisory Committee to the OECD (2015): 'There are no jobs on a dead planet.'

Education and lifelong learning can support the SDGs with at least two approaches. The first tends to focus on literacy acquisition and retention or on specific knowledge to generate behavioural change, showing that education can facilitate changes in values, world views and behaviour at the level of the individual, the community and society as a whole. This works particularly well when agreement exists on common values and the best and most desirable behaviours – for example, the idea that reducing food waste and energy consumption is important for sustainability and that people can reduce food waste and conserve energy at home.

The second approach focuses on the development of agency, competencies and participation, showing that education can facilitate reflective or critical learning, knowledge and skills acquisition, and greater agency to address complex sustainability issues – for example, how to create a sustainable school or a carbon neutral city. This is particularly important where uncertainty exists over what needs to be done or when context-specific solutions need to be identified through collaborative and iterative processes. Both education approaches are complementary for engendering critical learning and sustainability outcomes.

The transformation needed for a cleaner and greener planet requires integrative, innovative and creative thinking, cultivated jointly by schools, universities, governments, civil society organizations and companies. This collaboration calls for an education that goes beyond the simple transfer of knowledge and desirable behaviours by focusing on multiple perspectives – economic, environmental, ethical and sociocultural – and by developing empowered, critical, mindful and competent citizens. Such education can contribute to the realization of new forms of citizenship, entrepreneurship and governance that centre on the current and future well-being of people and the planet.

READER'S GUIDE TO THE REPORT

In the Incheon Declaration, the international education community affirmed the mandate of the Global Education Monitoring Report (GEM Report) as an independent, authoritative report, hosted and published by UNESCO, to serve as 'the mechanism for monitoring and reporting on ... SDG 4 and on education in the other SDGs, within the mechanism to be established to monitor and review the implementation of the proposed SDGs' (UNESCO, 2015b). Relying on 14 years of monitoring experience as the EFA Global Monitoring Report, the renamed GEM Report will continue to provide reliable, rigorous analysis of global progress in education through systematic and evidence based reporting.

The 2016 GEM Report (UNESCO, 2016), the first of a new 15-year series, shows that education will not deliver its full potential to catapult the world forward unless rates of improvement dramatically shift, and education systems consider sustainable development in the way services are delivered. This Partnering for Prosperity publication is a select extract from the full 2016 Global Education Monitoring (GEM) Report: *Education for people and planet: Creating sustainable futures for all* (UNESCO, 2016). It contains three chapters from that Report: Prosperity, Partnership and the policy recommendations to transform education for sustainable development. It also includes one chapter from the Gender Review of the 2016 Report, focusing on the links between education, gender equality and work.

A man stands in a
crop of cassava that
is being cultivated
using an improved
technique in
Boukoko, Central
African Republic.

CREDIT: Riccardo Gangale/FAO



CHAPTER

1

Prosperity: sustainable and inclusive economies

We are determined to ensure that all human beings can enjoy prosperous and fulfilling lives and that economic, social and technological progress occurs in harmony with nature.

– The 2030 Agenda for Sustainable Development



KEY MESSAGES

Education has a key role to play in moving towards environmentally sustainable and inclusive economic growth.

1 Education and lifelong learning are needed to make production and consumption sustainable, to provide green skills for green industries and orient research and higher education towards green innovation.

- a. Creating green industries relies on high-skill workers with specific training.
 - b. Greening of industries will require continuing training and education for low- and medium-skill workers, often on the job.
 - c. Research can be oriented towards green innovation and growth.
-

2 Education can help food production and farming be more sustainable.

- a. Agriculture urgently needs to transform to meet environmental and global needs: Agriculture contributes one-third of all greenhouse gas emissions.
 - b. Primary and secondary education give future farmers foundation skills as well as critical knowledge about sustainability challenges in agriculture.
 - c. Literacy and non-formal education in the form of extension programmes can increase farmer productivity.
 - d. Yet many are halting investment in agricultural research at a time when it is urgently needed: In sub-Saharan Africa, the share in global expenditure on public agricultural research declined from 10% to 6% from 1960 to 2009.
-

3 Education contributes to economic growth.

- a. Educational attainment explains about half the difference in growth rates between East Asia and sub-Saharan Africa between 1965 and 2010.
 - b. But education must keep up with the changing face of work and produce more high-skill workers. By 2020, there could be 40 million too few workers with tertiary education relative to demand.
-

4 Education of good quality can help ensure economic growth does not leave anyone behind.

- a. If 10 recent EU member states met 2020 targets to decrease early school-leaving and increase tertiary participation, they could reduce the numbers of those at risk of poverty by 3.7 million.
 - b. Secondary and tertiary education is far more effective than just primary for helping people access decent work and earnings.
-

5 Education reduces poverty and helps close wage gaps.

- a. Education helps people find work: In South Africa, less than 45% of those with less than upper secondary education were employed in 2005 compared to roughly 60% who completed upper secondary.
- b. If workers from low socio-economic backgrounds had the same education as more advantaged counterparts, disparity in working poverty between the two groups would shrink by 39%.
- c. Education increases earnings by roughly 10% per year of schooling.
- d. Meanwhile, policies are needed to meet the increased global demand for skilled and qualified labour.

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The world economy needs deep transformation in order to implement the Agenda for Sustainable Development by 2030, to prevent the collapse of the Earth’s biosphere on which human civilization depends for survival, and to eradicate poverty – the central goal of the Millennium Development Goals (MDGs) and now of the Sustainable Development Goals (SDGs). This chapter reflects on the roles of education in this transformation towards environmentally sustainable and economically inclusive development.

The 2030 Agenda for Sustainable Development makes a commitment to human beings enjoying prosperous and fulfilling lives. However, as this chapter will explain, economic growth and both national and individual prosperity must occur ‘in harmony with nature’. This requires fundamental changes in the world economy to create clean new industries and ensure that existing ones become greener.

Education and lifelong learning are needed to make production and consumption sustainable, supply skills for the creation of green activities and orient higher education and research towards green innovation. They also have a role to play in transforming key economic

sectors, such as agriculture, upon which both rich and poor countries and households rely.

Education of good quality has been proved to contribute to long-term economic growth. Curricular contents, and the ways they are embedded in the everyday life of schools, need to be transformed to sustain a greener world economy. Investment in education and lifelong learning are also required for countries to adapt to the rapidly changing world of work, with polarization between high- and low-skill jobs, and further shifts to green industry and the service sector.

Just as the economy must become sustainable, so too must it become inclusive. With widespread poverty and inequality, economic growth has not benefited all people. Prosperity must be conceived in ways that leave no one behind. Education of good quality can contribute to this change as well. A better-educated labour force is essential to inclusive economic growth focused

“ A better-educated labour force is essential to inclusive economic growth ”

on human welfare. Education helps reduce poverty by increasing chances of finding decent work and improved earnings, reducing job insecurity.

CURRENT MODELS OF ECONOMIC GROWTH CAUSE ENVIRONMENTAL DESTRUCTION

The type of economic growth experienced thus far could prove unsustainable over 2015–2030 and beyond. Models of economic growth in the 20th century emphasized aspects such as intensive production, industrial advances and exploitation of natural resources. These models legitimized practices and policies that thwart achievement of the environmental SDGs, causing damage to the Earth's biosphere and hence threatening civilization in the longer term.

As Chapter 1: Planet notes, all countries that are ranked very high on the Human Development Index (above 0.8) and have a high per capita income consume more resources per capita than the Earth can renew (Global Footprint Network, 2016). This creates a contradiction. Economic growth is the most powerful instrument for reducing poverty in developing countries (DFID, 2008), but if that growth depletes resources at an unsupportable rate, will it start to increase poverty? For example, poor people suffer the most from environmental degradation as they often live in the most vulnerable areas and their livelihoods tend to be linked more directly to access to natural resources.

Climate change is an example of the effects of economic growth, and the reason a transformation of economic models is necessary. The increased frequency and intensity of extreme climate events, reduced productivity of agriculture and natural ecosystems due to changing temperature and rainfall patterns, and resulting health shocks and reduced labour productivity may slow, stall or even reverse the trend towards eradication of extreme income poverty observed over 2000–2015.

Overall, climate change could cast as many as 122 million people into poverty by 2030, depending on how ecosystems, the economy and geographical features such as coastal areas and glaciers adapt. Climate change could reduce crop yields by 5% by 2030 and 30% by 2080 – even if agriculture adapts by changing crops and culture practices, extending irrigation and developing higher yield crops (Hallegatte et al., 2016).

SUSTAINABLE TRANSFORMATION WILL REQUIRE CLEAN NEW INDUSTRIES AND GREENER EXISTING ONES

The concepts of sustainable development and green growth are similar, having in common the ideas of using less resources more efficiently and limiting the harmful impact of economic activity on the environment by creating green industries and 'greening' existing ones (UNIDO, 2011b). They also mean dismantling the activities that contribute most to environmental degradation, such as coal-intensive industries, and converting them and their employees to greener work.

Green industry is defined by the United Nations Industrial Development Organisations as 'industrial production and development that does not come at the expense of the health of natural systems or lead to adverse human health outcomes' (UNIDO, 2011b). However, green industries are difficult to classify statistically, and there is no universally accepted definition.

Estimates suggest that sectors that fall under the green industry umbrella already employ large numbers of workers – 3.5 million in Bangladesh, 1.4 million in Brazil, 2 million in Germany and, in the United States, 2.5 million in the private sector and almost 900,000 in the public sector. The net impact of green growth on employment is usually forecast as positive, though some industries stand to lose jobs. Sectors such as alternative fuels, building technologies, wind power, alternative fuel vehicles, geothermal energy, water supply and wastewater treatment are expected to drive sustained expansion in green industries globally in coming decades (Hinojosa and Pickles, 2015). Renewable sources may account for almost half the total increase in global electricity generation between 2015 and 2040, with especially large increases predicted in China, India, Latin America and Africa (Hinojosa and Pickles, 2015).

The current concentration of green industries in high income countries, especially in Western Europe, is expected to wane. In 2009, the European Union accounted for 50% of recycling worldwide and 40% of the use of renewable energy sources (Hinojosa and Pickles, 2015). However, between 2005 and 2015, the share of developing countries in global renewable energy investment rose from 27% to 55%, reaching US\$156 billion in 2015 to overtake developed economies (REN21, 2016). Key green businesses, such as producers of

solar photovoltaic panels, have been moving from high to middle income countries. Green industries in developing countries may receive more than US\$6.4 trillion in investment between 2015 and 2025, with China and Latin America each receiving nearly one-quarter of the total (InfoDev, 2014).

Existing industries need to be restructured for efficiency gains. This greening of industries, by the UNIDO definition, includes reducing the environmental impact of processes and products by using resources more efficiently, phasing out toxic substances, replacing fossil fuels with renewables, improving occupational health and safety, increasing producer responsibility and reducing overall risk (UNIDO, 2011). There could be significant benefits in terms of savings: by 2030, an estimated US\$3.7 trillion could be saved annually worldwide from implementation of 130 resource productivity measures and adapted legislation (MGI Global, 2011).

GREEN SKILLS POLICIES CAN FOSTER JOB CREATION

Green growth will greatly affect employment. Jobs will be created in green industries; jobs will be shifted as industries are greened (e.g. with production-based renewables instead of fossil fuels); some will be destroyed; and many will be redefined as skills, work methods and job profiles are greened. The hardship caused by job destruction and redefinition should not be underestimated, as the industries affected – including fishing, forestry, extractive industries, fossil fuel generation and emission-intensive manufacturing (such as the cement and automotive industries) – employ large numbers (Hinojosa and Pickles, 2015).

However, forecasts indicate the net result should be positive. A review of cross country and national studies¹ by the International Labour Organization (ILO) indicates that the adoption of environmental reforms leads to net job gains of 0.5% to 2% of the workforce, translating to 15 million to 60 million additional jobs globally (ILO, 2012). In South Africa, the potential for new green jobs was estimated in 2011 at 98,000 in the short term, 255,000 in the medium term and 462,000 in the long term, especially in natural resource management such as biodiversity conservation, ecosystem restoration, and soil and land management (Maia et al., 2011).

One reason for the positive impact on employment is that green industries tend to be more labour-intensive. For instance, sustainable farming requires more labour than conventional farming, with more diverse crop rotation, integration of crops and livestock to recycle organic waste as soil nutrients, and reliance on biological processes for pest and weed management. Similarly, to improve energy efficiency the construction sector has employed large numbers of workers (Hinojosa and Pickles, 2015; Maia et al., 2011).

The changes in employment and job definitions accompanying green growth will create huge demand for skills development. The creation of green industries will rely on high skill workers with technical training; the greening of existing industries will require continuing education and training for low and medium skill workers, often on the job (ILO, 2013a; UNIDO, 2011b). The balance

“ The creation of green industries will rely on high skill workers with technical training ”

of skills required will vary across countries and industries – but in every context, skills policies can facilitate this transition.

It is difficult to define which skills would be specifically ‘green’ or ‘non-green’, as both green and greening industries use a mix of both. There is therefore very little evidence quantifying what the ‘green skill gap’ might be at the global level, although it is possible to identify skills which green and greening industries demand (**Box 1.1**).

The implications of green growth for education and training policies are complex and often industry-specific. Policy-makers and educators face the challenge of defining which skills to teach, even as the economy is undergoing rapid change. They must also balance current and long-term priorities, deciding, for example, how much focus to give to redefining initial education and training as opposed to up-skilling and retraining the current labour force. They need to develop flexible education and training frameworks in line with the capabilities and aspirations of students and trainees. Specific policy recommendations in this area are found in Chapter 8.

BOX 1.1**Green industries demand particular skills**

Green industries demand particular skills, including basic, technical, and transferable and managerial skills.

- Basic skills, including literacy and numeracy, are indispensable. Green growth reinforces the need for good quality basic and remedial education, both in countries which have not yet reached universal enrolment at the primary and lower secondary levels, and in countries with low levels of basic skills in the adult population.
- Technical skills can be specific to green industries (e.g. diagnostic skills to measure a carbon footprint) or added to existing skills (e.g. up-to-date training in energy efficiency for construction workers with standard skills).
- Transferable and managerial skills include leadership, risk management, design, communication and commercial skills that are necessary to enable firms to make the transition towards green production. For example, those with entrepreneurial skills can seize the opportunities presented by low-carbon technology, and consulting skills can be used to advise consumers about green solutions and spread the use of green technology.

Source: GEM Report team analysis based on Hinojosa and Pickles (2015).

INNOVATION DEPENDS ON COOPERATION IN HIGHER EDUCATION AND R&D BACKED WITH PUBLIC FUNDING

The transition towards sustainable economies can be seen as being on a par with the paradigm shifts brought about by the industrial revolution and the advent of information and communication technology (ICT) (Stern, 2015). Sustainability and green growth require investment in research and development (R&D) to transform production in vast swaths of the economy. They involve refining existing technology to save energy, using renewables and, above all, introducing technology that is only just being developed (Aghion et al., 2009a).

In Cuba, the Centre for Research and Development of Structures and Construction Materials (CIDEM) developed alternative ways to solve a building and energy crisis. Researchers developed low-energy, low-carbon building materials and worked with communities, municipalities and manufacturers

to get them into use building houses. In addition to environmental benefits, the project generated significant socio-economic benefits. In 2010 and 2011, 5,300 houses were built using such materials made by 138 manufacturers, providing livelihoods to many people. Three training centres have been established at universities and this model of developing sustainable building materials has been adopted by other countries in Latin America as well as Africa, Asia and the Middle East (Sarabhai and Vyas, 2015).

While examples of green innovation practices can be found around the world, more is needed to turn practices into a system – that is, an ensemble of actors and conditions that enable the creation and flow of knowledge and technology into the economy. For this, other conditions must be present, such as collaboration between researchers, funders, manufacturers, government and consumers, in a context of change in broader macroeconomic, investment and policy environments (Botta et al., 2015).

The role of education in innovation primarily concerns R&D in new technologies, as well as their dissemination. For higher education systems to provide enough researchers and developers with specialist knowledge and skills in a wide range of fields, diverse and specific curricula are needed along with cooperative study programmes across fields. Major emerging economies such as Brazil and China are expanding their tertiary education systems with that approach in mind. The European Commission estimates that at least 1 million new research jobs will be needed to meet a target of increasing EU R&D expenditure to 3% of gross domestic product (GDP) (European Commission, 2011).

Once developed, innovative knowledge and technology need to be introduced into the economy. Scaling up technology, building capacity and developing markets may require adaptation to local contexts, particularly in poorer countries, where technological transfer presents a hosts of challenges. A rigorous review of research reveals little evidence of the impact of technological transfer in developing countries, although two cases stand out (Oketch et al., 2014). Large state-run corporations in Viet Nam are more likely than small and medium-sized enterprises to demonstrate high levels of technological transfer, probably because of their contact with foreign firms. However, one of the studies reviewed indicated that university-generated research had improved productivity in local agriculture and aquaculture

(Ca, 2006). The small amount of empirical evidence available related to tech transfer and scaling up highlights the need to better understand the relationships between innovation, technology and economic development in poor countries.

Green innovation systems depend on public funding of R&D, as the private sector may be unable or unwilling to invest sufficiently in green technology in the early stages of development, when costs are high, returns are uncertain and the benefits are social rather than private (Aghion, 2009a; OECD, 2011). Unfortunately, total public and private R&D expenditure as a share of GDP has not grown discernibly in the OECD or major emerging countries since 2007. In 2013, it represented slightly less than 2.5% of GDP in OECD countries, ranging from less than 0.5% in Chile to almost 4.5% in the Republic of Korea (OECD, 2014c).

Moreover, public R&D spending in energy and the environment is only a small fraction of total public R&D budgets, averaging less than 12% in OECD economies, and less than 6% in the EU. Moreover, public R&D budgets for energy and the environment have stalled across the OECD in recent years. OECD military public R&D was more than double that of energy and environment in 2012, and approximately 30 times as large in the United States (OECD, 2014c). The International Energy Agency estimates that governments would need to increase annual energy R&D up to fivefold to significantly reduce carbon emissions by 2050 (IEA, 2010). Corresponding data on private R&D expenditure are not available, but the fact that over 2000–2006 only 2.15% of total patents applied for worldwide were environment-related indicates that it is low (Aghion et al., 2009b).

LIFELONG LEARNING ENABLES CONSUMERS AND PRODUCERS TO CONTRIBUTE TO SUSTAINABILITY

While green skills and green innovation can reduce environmental destruction caused by economic activity, the leap towards fully sustainable consumption and production requires a deeper transformation of the economy. The whole life cycle of products needs to be designed to minimize resource use, waste and pollution. Examples include certification of the entire production and consumption chain, and ‘cradle-to-cradle’ design where all products and waste can be used in making other products. Another approach is the service-based

economy where consumers no longer own products but lease the services they provide.

Developing, understanding and working with such approaches requires learning by both consumers and producers, which education policies can best address in a lifelong learning perspective. The United Nations Environment Programme has identified learning-related priorities for sustainable consumption and production. These include new forms of (a) education for industry employees, including sustainability-oriented technical and vocational education and training (TVET) and ongoing training within companies; (b) learning at all levels of supply chains, with attention to empowerment of suppliers and customers, rather than compliance inspections; (c) interdisciplinary scholarship focusing on altering consumer habits; and (d) social learning at the community level (UNEP, 2015).

Relevant international agreements and programmes include the United Nations Decade for Education for Sustainable Development, with topics such as Education for Sustainable Consumption, TVET for Sustainable Development and Higher Education for Sustainable Development. The multistakeholder Marrakesh Process (2003–2011) led to the adoption of a framework at the United Nations Conference on Sustainable Development in 2012 (Rio+20). National sustainable consumption and production initiatives have been launched in countries including Finland, Germany and the United Kingdom (Geels et al., 2015).

Business owners, managers and financiers can be leaders in sustainability. Large and small corporations can develop strategies and analyse their business culture and work systems to make them more sustainable (see Chapter 1: Planet). Studies have shown that business courses increasingly teach the ‘business case’ for sustainability, and that professional networks of business leaders increasingly accept the importance, relevance and willingness of action (Sidiropoulos, 2014), although many of the findings are limited in geographical coverage and trends appear patchy across industries and locations.

Shareholder activism has resulted in movements to divest from fossil fuels and to invest so as to generate a positive social impact along with financial returns. Progress in corporate sustainability has seen the expansion of sustainable finance, with mainstream banks increasingly integrating environmental and social impact

considerations and risk management strategies into loan and investment assessment (UNEP, 2012; OECD, 2016b).

AGRICULTURAL PRACTICES NEED TRANSFORMATION

Focusing on agriculture shows not only the scale of problems to be tackled but also how an economic sector can change and how education can address the changes. Globally, some 70% of people in extreme poverty live in rural areas (IFAD, 2011b) where agriculture is the main source of income and employment, and access to land serves as a tangible source of security despite natural disasters and weak economic opportunity. Solutions for global poverty must address the needs of agrarian societies and ensure the sustainability and productivity of agriculture. Agriculture provides the world's food supply, and major factors affecting it also affect the world's economy and ecosphere.

Agricultural production is the main emitter of carbon dioxide in the global food system (Vermeulen et al., 2012). Increases in carbon dioxide contribute to climate change, which in turn has a negative effect on crops. Yields of wheat, rice and corn are expected to fall in coming years, even as growing populations will need more to eat. By emitting high levels of greenhouse gases, conventional agricultural practices present a barrier to the main challenge they seek to address, potentially leading to food shortages instead of food security.

Education, both formal and non-formal, has a clear role in this context: It is necessary for sustainable food production and vital for the systemic changes required. Agricultural extension services, training and education, and research contribute to sustainable agricultural production through appropriate and affordable technology (such as efficient irrigation, water harvesting and water storage), increased efficiency of land management and reductions to food waste throughout

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Agricultural extension
services, training and
education, and research
contribute to sustainable
agricultural production

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the food supply chain. Research also helps preserve sustainable practices such as traditional seed supply systems and best practices of indigenous peoples and local communities.

Agriculture worldwide faces an unprecedented challenge over 2015–2030. Of all economic sectors, it is the most directly affected by environmental degradation. Cultivated and arable land is being lost to desertification, soil erosion and salinization, and urbanization. Climate change is altering temperature and rainfall patterns. Extreme weather is causing ever more frequent and intense damage to crops and cattle (Godfray et al., 2010). Groundwater depletion, from China and India to Saudi Arabia and the United States, is affecting harvests and could contribute to significant food scarcity (Wada et al., 2010). These phenomena will intensify, threatening agricultural productivity.

At the same time, population growth requires a huge but sustainable increase in food production to ‘end hunger [and] achieve food security and improved nutrition’ (SDG 2). The global population, as Chapter 1: Planet noted, is expected to reach 8.5 billion in 2030, with nearly four-fifths of the increase taking place in low and lower middle income countries, especially in sub-Saharan Africa and Southern Asia, where the food supply is the most fragile. According to various sources, the productivity of existing crop and pasture land would need to increase by 70% to 100% to feed over 9 billion people by 2050 (Godfray et al., 2010).

Conventional agriculture – the manufacture and distribution of seed, feed, fertilizer and pesticides; the growth and harvesting of crops, livestock, fish and wild foods; and along with primary and secondary processing, distribution and waste disposal – cannot respond to these challenges, as it causes environmental destruction and its future productivity is uncertain. The problem is threefold:

- Along with energy and transport, agriculture is one of the sectors that contribute most to environmental degradation. It occupies 40% of the Earth's terrestrial surface, accounts for 33% of greenhouse gas emissions and causes loss of genetic biodiversity and functional ecosystems. The ‘green revolution’ that took place mainly in Asia in the 1960s and 1970s was ‘green’ only in the sense that it concerned agriculture, not in the sense of environmental preservation. Future increases in food production must not entail unsustainable use of land, water, energy, fertilizer and chemicals (Alston and Pardey, 2014; Dobermann and Nelson, 2013; Pretty et al., 2010).

- Conventional agriculture may be reaching a productivity limit. According to the Food and Agriculture Organization (FAO), the index of per capita net production for agriculture as a whole increased less rapidly over 2008–2013 than over 2003–2008 in the Americas (4.1% vs 10.3%), Asia (7.9% vs 15.3%) and Europe (3.4% vs 5.5%) (FAO, 2016). Increases in agricultural productivity were concentrated in developed countries and Asia. In sub-Saharan Africa and in low income countries in other regions, most growth in production since 2000 was due to use of new land rather than higher factor productivity (Dobermann and Nelson, 2013). Food prices, which had mostly declined steadily since the 1960s, started to increase in the 2000s, and have become more volatile due to speculation on financial markets. Major price increases in 2007 and 2008 especially hit the poor (IFAD, 2011a).
- Food distribution and consumption patterns are compounding the negative impact of food production on the environment. In developing countries, rising per capita income has led to tastes shifting away from cereals, pulses and vegetables and towards meat and dairy products, whose production is much more intensive in use of water, fodder and chemicals (Pretty and Bharucha, 2014). The major concern, however, is food waste, which represents 30% to 40% of food produced globally. In developing countries, most food waste arises on farms and in transport and processing due to deficient food-chain infrastructure. In India, for example, 35% to 40% of fresh produce is lost. This waste could be reduced through improved small storage facilities (Godfray et al., 2010). In developed countries, food waste takes place mostly in retail, food services and homes due to consumer preferences for ‘foods of the highest cosmetic standard’ and inflexible adherence to ‘use by’ dates (Godfray et al., 2010).

EDUCATION CAN SUPPORT SUSTAINABLE FOOD PRODUCTION

Enough food can be produced for the growing world population over 2015–2030 and beyond in an environmentally sustainable and socially inclusive way, but this will require significant changes in agricultural production (Godfrey et al., 2010; Pretty and Bharucha, 2014). With current food production reaching its limits, alternatives to conventional farming must be found. They will involve sustainable intensification of food production through a combination of innovative

farming methods – including agroforestry, conservation agriculture, integrated farming, mixed crop and livestock systems and organic farming – accompanied by reduction of food waste and more equitable food distribution.

Growth in demand for agricultural products will mainly occur in emerging economies, particularly the most populous countries of Eastern and South-eastern Asia, Southern Asia and sub-Saharan Africa. The ways in which these countries, including Bangladesh, China, Ethiopia, India, Indonesia, Nigeria and South Africa, respond to this growth will be major determinants of environmental change at a global scale (Sayer and Cassman, 2013).

Not only is sustainable farming possible, but education plays a key role in the transition. Primary and secondary education can provide future farmers foundation skills

“ Vocational training and skills policies bridge the gap between farmers and new technology ”

as well as critical knowledge about sustainability challenges in agriculture. Vocational training and skills policies can bridge the gap between farmers and new technology. Literacy and non-

formal education in the form of agricultural extension can help farmers increase crop yields. Agricultural research connected with tertiary education helps produce innovation leading to more sustainable systems.

The number of people relying on farming is considerable. In the early 2010s, half the world’s population lived in rural areas and three-quarters of rural people belonged to agriculture-based households: 2.6 billion depended on agriculture for their livelihoods and 1.3 billion directly engaged in farming. However, value added in agriculture accounts for just 2.8% of global GDP (Alston and Pardey, 2014). A majority of farmers depend on farms of less than 2 hectares, of which there are more than 500 million (Dobermann and Nelson, 2013).

Rural development policies which improve agricultural productivity can have strong effects on poverty reduction. In China, for example, agricultural growth is estimated to have been three times more effective in reducing poverty between 1980 and 2011 compared to growth in other sectors of the economy. Similar magnitudes are found in studies examining other

developing regions (de Janvry and Sadoulet, 2010). Among several sub-Saharan African countries, estimates suggest that GDP growth driven by agriculture would be similarly effective in reducing poverty - three to four times more than non-agricultural sectors in Rwanda and Kenya, for example (IFPRI, 2012).

AGRICULTURAL EXTENSION AND RESEARCH ARE VITAL FOR TRANSFORMING PRODUCTION

Agricultural extension programmes aim to educate farmers to apply improved technologies and farming practices, helping improve crop yields, increase food security and reduce poverty. They can take the form of non-formal education and advisory services provided

“ Literacy and non-formal education in the form of agricultural extension can help farmers increase crop yields

by government, multinational agencies and other institutions, such as research institutes and universities. International agricultural research centres, in collaboration with national public

organisations, were instrumental in the widescale introduction of new crop varieties which fuelled the agricultural ‘green revolution’ of the 20th century (Evenson and Gollin, 2003). Bringing new sustainable technologies to farmers over 2015-2030 calls for similar international and national efforts.

Agricultural extension programmes can significantly increase farmer productivity. If not designed carefully, however, they can exacerbate inequality. Research in Mozambique and Ethiopia shows that extension services tend to target wealthier farms that are more likely to adopt existing technology, while extension services that target poor farmers can have a larger impact on productivity (Cunguara and Moder, 2011; Elias et al., 2013).

Like other development policies, extension programmes need to be strategically designed in order to be sustainable. This requires improved links between agricultural research, extension organisations, business development services, farmers and local communities. Programmes which are aware and responsive to the needs of resource-poor households are more likely to result in faster diffusion of innovations (World Bank, 2012).

At the farm level, knowledge and skill requirements are significant. Farming is complex and risky. It depends on the extent and quality of the land, as well as weather, markets, inputs, support services, capital and infrastructure (Dobermann and Nelson, 2013). Innovative farming is even more challenging. Extension programmes thus need to be participatory and incorporate local knowledge. They also need to address their frequent bias towards male farmers (Pretty et al., 2010). Women form a significant share of farmers and agricultural workers, and increasing their productivity could have a large positive impact on family and child nutrition (FAO, 2011).

Farmer field schools are particularly relevant to sustainable agricultural intensification. They have spread since the late 1980s as part of a broader shift away from top-down agricultural extension (Waddington et al., 2014). They now reach over 12 million farmers in some 90 countries with a participatory approach to adult education and learning. Their aims are to provide skills in areas such as cultivation practices and pest management so as to increase yield and revenue while reducing environmental impact (FAO, 2016).

A recent systematic review based on 92 evaluations found that farmer field schools increased farmers’ knowledge by 0.21 standard deviation on average, leading to average increases in yield by 13% and net revenue by 19%. They also reduced environmental impact (an aggregate index decrease by 39% on average) and pesticide use (by 17%). Education quality is vital to this model: Facilitators with strong literacy and numeracy skills, experience with farming, and willingness to use bottom-up training methods, follow a locally relevant curriculum and use the local language obtain the best results (Waddington et al., 2014).

Critical questions about how to move agricultural extension forward remain. For example, how can extension services reach and engage the widest number of farmers to facilitate institutional change and technical innovation, and what are the most effective extension strategies (Pretty et al., 2010)? Increasing productivity is necessary but not sufficient to ensure food security, reduce poverty, improve nutrition and maintain the natural resource base for sustainable development (Sayer and Cassman, 2013). Innovation is needed across a broad spectrum of policies and technologies to confront the complex array of challenges at the agriculture–environment nexus.

In many regions, climate change will result in more frequent drought and low rainfall, making current farming practices less viable. Such conditions call for the introduction of new methods and technologies. This could include the application of sustainable organic farming methods, which have been shown to produce higher yields than conventional agriculture under drought conditions, as well as reduce negative environmental impacts (Reganold and Wachter, 2016).

Agricultural research can help answer some of the dilemmas extension services face. Through a cross-disciplinary lens vital to the systemic change needed, it can bring about more sustainable practices. Generally based at universities and technical institutes, agricultural research includes collaboration by a wide variety of scientists, industrial partners and government agencies. An analysis of more than 1,000 scientific publications by France's National Institute for Agricultural Research provides insight into the types of research taking place: methods and techniques to improve productivity and the environmental, health and socio-economic impact of agriculture, ways to improve coordination between public research and industry, and scientific advice to inform policy-making (Gaunand et al., 2015).

Such research highlights a shift from isolated campus research centres towards active engagement with farming communities and industry partners, and public programmes to encourage experimentation and innovation. New research provides insights from many areas, including innovation studies, socio-technical transition studies, rural and political geography, resilience thinking and climate risk management literature (Rickards and Howden, 2012).

The Integrated Agricultural Research for Development (IAR4D) concept is an example of this interdisciplinary approach. IAR4D is based on a systems science approach which includes many of the underlying principles of sustainability science. These include economic growth by linking farmers to markets, conservation of natural resources, biodiversity, limited carbon dioxide production, food security, and social inclusion and equity. This integrated approach to farming facilitates research on rural services and policies in order to understand farmers' access to markets, credit and other key rural services. Empirical evidence for the integrated approach is positive, although still sparse and weak. Impact analyses of household surveys in the Democratic

Republic of the Congo, Nigeria, Rwanda and Uganda show that the IAR4D approach has some benefits for farmer income compared with conventional research approaches (Ayanwale et al., 2013; Nkonya et al., 2013).

Climate change and associated food security concerns are prompting growing calls to reverse reductions in government investment in agricultural research, development and extension. Many countries have halted or reduced investment in agricultural research, whether directly or as donors. The key challenge is in sub-Saharan Africa, whose share in global expenditure on public agricultural research declined from 10% in 1960 to 6% in 2009. By comparison, Brazil, China and India together accounted for 31% in 2009. In 2010, public agricultural and food research worldwide received about US\$35 billion, while private research totalled between US\$20 billion and US\$22 billion, which was heavily concentrated in high income countries and focused on innovations in off-farm sectors such as food processing (Alston and Pardey, 2014; Mellor, 2014). Much more investment is justified – the FAO estimates the returns to public spending on agricultural R&D in Uganda at more than 12% (Dobermann and Nelson, 2013).

EDUCATION AND LIFELONG LEARNING CONTRIBUTE TO LONG-TERM ECONOMIC GROWTH

Mainstream economic analysis has highlighted increased levels of primary and secondary education as a key driver of long-term economic growth. Data show that initial levels of educational attainment explain about half the difference in growth rates between East Asia and sub-Saharan Africa between 1965 and 2010 (UNESCO, 2014).

At the individual level, the knowledge and skills workers acquire through education and training make them more productive. Provision of good quality education can improve the knowledge and skills of a whole population beyond what traditional or informal systems can achieve. For business, educated and highly skilled workers foster productivity gains and technological change, through either innovation or imitation of processes developed elsewhere. At the societal level, education expansion helps build social and institutional capital, which has a strong impact on the investment climate and growth; it also helps in building social trust, developing participatory societies, strengthening the rule of law

and supporting good governance (Acemoglu et al., 2014; Bjørnskov, 2012; Knack and Zak, 2003).

For countries to prosper in their participation in the world economy, investment in education is a must. Low and lower middle income countries need to invest in secondary and tertiary education and expand lifelong learning opportunities to increase high-value added activities in the industrial and service sectors. This is particularly true of sub-Saharan Africa. By 2014, the region's gross enrolment ratio in tertiary education

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Increasing tertiary attainment by one year on average would increase sub-Saharan Africa's long-term GDP level by 16%
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was 8%, far below the second-lowest regional average, that of Southern Asia (23%), and the global average (34%).

Historically, as the estimated benefits to investment in education were lower for higher education than for primary and secondary

education, the World Bank and others discouraged investment in the tertiary level (Basset and Salmi, 2014). But recent evidence on the impact of higher educational attainment on growth, pertaining to 108 countries over 1975–2010, suggests that increasing tertiary attainment by one year on average would increase sub-Saharan Africa's long-term GDP level by 16% and increase growth through technological catch-up by 0.06 percentage points a year (Bloom et al., 2014).

... BUT THE QUALITY OF EDUCATION IS CRUCIAL

The provision of good quality education is central: Increasing enrolment rates will not have as much positive impact on national economic growth if students do not reach sufficient learning outcomes (Pritchett, 2006). Years of schooling is a problematic indicator of workers' actual skills because of differences in school quality within and between countries, in achievement between students of the same social class and in acquisition of skills through other sources.

While results of the Survey of Adult Skills in the OECD Programme for the International Assessment of Adult Competencies (PIAAC) are too recent to correlate with long-term growth, surveys of student achievement conducted since the 1960s by the International Association for the Evaluation of Educational

Achievement (IEA), along with results of the OECD Programme for International Student Assessment (PISA), have been used as a proxy for the quality of education that adults received (Barro, 2013).

This strand of research has provided evidence of a substantive link between skills developed through education and economic growth. It has clearly been shown in relation to skills in mathematics and science. Across 50 countries, the average of mathematics and science test scores available between 1964 and 2003 had a significant and positive impact on economic growth over 1960–2000. A standard deviation increase in test scores was associated with a two percentage point annual increase in GDP growth (OECD, 2015d).

Research also shows that basic and advanced skills have complementary effects on growth. Both the share of students achieving at least basic skills (ranging from 42% in low income countries to 80% in high income countries) and the share achieving advanced skills have a positive impact on growth. However, the impact of the share of advanced skills is comparatively larger in countries with more scope to catch up with the most advanced economies, reflecting the importance of advanced skills for technological diffusion (OECD, 2015d).

The provision or relative lack of good quality education helps explain the East Asian 'miracle' and Latin America's 'lost decades'. Despite relatively high average years of schooling and per capita income around 1960, most Latin American countries have had low test scores in the decades since, whether measured in international surveys or in regional assessments conducted by the Latin American Laboratory for Assessment of the Quality of Education. By contrast, many East Asian countries have had higher test scores than could be predicted based on the same variables. Differences in test scores between the two regions can explain their different growth records. Within the regions, countries with higher scores had more rapid growth, e.g. Brazil and Chile compared with the Plurinational State of Bolivia, Honduras and the Bolivarian Republic of Venezuela, and the Republic of Korea and Singapore compared with Indonesia and the Philippines (Hanushek and Woessmann, 2012).

Analysis of a sample of lower middle income countries found that if all children were to acquire basic skills by 2030, GDP would be 28% higher over the following 40 years compared with what would be expected with current skills levels. The increase in GDP for upper middle

income countries would be 16% and that for non-OECD high income countries 10%, reflecting higher enrolment and skills levels. Even high income OECD countries would gain significantly from bringing all students up to basic skills by 2030, with GDP 3.5% higher than otherwise (OECD, 2015d).

EDUCATION POLICIES WILL HELP COUNTRIES ADAPT TO A FAST-CHANGING WORLD OF WORK

The world of work has undergone rapid change in recent decades. ICT has dramatically changed how we live and work and how economies are structured. This change is especially apparent in more developed regions and in urban areas. In poorer countries, there has been substantial movement from agricultural to non-farm employment. Moreover, greater integration of the global economy has opened up economic and trade opportunities across the world, enabling rapid growth in the now major economies of Brazil, China and India, while displacing industries and occupations in advanced economies through off shoring, particularly among less educated workers (Autor et al., 2014).

Two trends with profound implications can be expected to shape labour markets in many countries in the foreseeable future. First, polarization between low and high skill work and reduced demand for medium skilled employment has been widely documented in industrialized economies, but can also be observed on the global level. Second, stagnation in manufacturing employment makes it uncertain that poor countries can follow the developmental paths which historically have greatly improved working conditions among the poor. These interrelated trends can be expected to significantly shape the scope for decent employment across countries, challenging policy-makers to increase the supply of highly skilled and appropriately skilled workers, while creating conditions in which an educated workforce can be employed and adequately utilized.

Education systems must adapt to job polarization

Recent evidence from high income countries has led to increasing awareness of polarization between high and low skill work. A resulting proposition is that technological changes underpin the large relative drops in medium skill employment and corresponding increases in high and low skill employment across Europe and Northern America. Increasingly sophisticated technology has not only raised demand for high skill workers by complementing

their creative and problem-solving abilities, but has also displaced workers in medium skill jobs whose relatively repetitive and procedural tasks are more easily replicated in computer hardware and code, and overseas (Autor and Dorn, 2013; Autor et al., 2006; Goos et al., 2014; Jaimovich and Siu, 2012).

Evidence suggests that similar processes may also be under way in other regions, although it is premature to draw conclusions. The global employment share of high

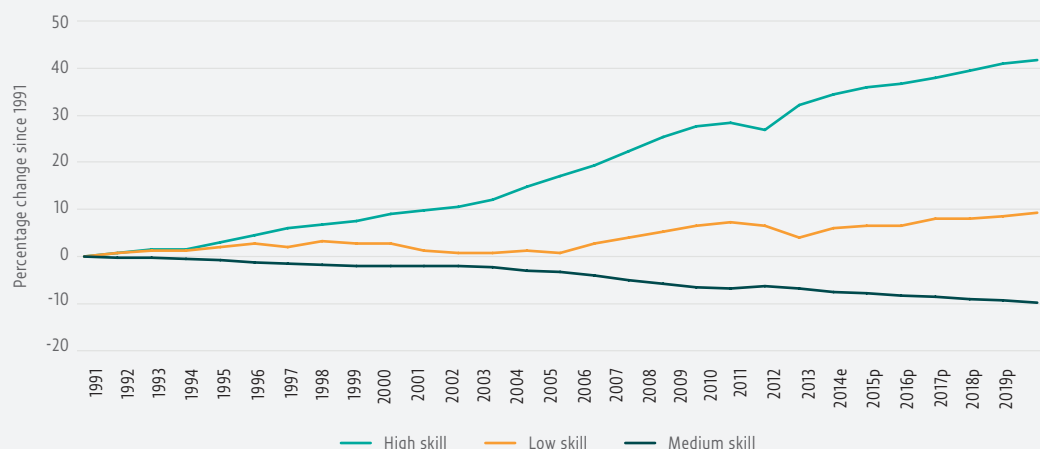
“ The global employment share of high skill workers has increased by almost 40% since 1990 ”

skill workers has increased by almost 40% since 1990, and is projected to have accounted for almost 20% of the workforce in 2015 (Figure 1.1). Over the same period, the employment share

of medium skill work decreased by almost 10%, while the share of low skilled work rose correspondingly. These trends are projected to continue in coming years.

Globally, as in industrialized countries, the majority of employment remains in medium skill occupations, which are projected to have made up slightly less than two-thirds of total employment in 2015 (ILO, 2015c). However, their share may decline significantly in coming decades as increasingly cheap and capable computer programs replace clerical workers and robots displace garment makers and machine operators². In China, for example, automation has had a substantial impact on factory employment, and this trend could accelerate as wages rise and automation technology becomes cheaper. In the context of rising manufacturing wages, President Xi Jinping in 2014 called for a ‘robot revolution’ (Chan, 2015), which already appears to be under way. The consumer electronics manufacturer Foxconn, one of the largest employers in China (and the world), plans to automate about 70% of its factory work by 2018, and already has a fully robotic factory in Chengdu (Lin, 2015).

Education systems face the dual challenge of ensuring that those who enter medium skill work have the skill sets to avoid obsolescence and of meeting the economy’s increased demand for skilled workers, demand that is likely to continue in the foreseeable future given that computer code is no substitute for the creativity and cognitive abilities of high skill workers. Yet evidence suggests that most education systems are not keeping up.

FIGURE 1.1:**Employment is being polarized by skill category on the global level***Percentage change in global employment shares from 1991, by occupational skill level*

Notes: Skilled occupations are classified according to one digit ISCO-08 codes, following the ILO Global Employment Trends (GET) Model Extension (GME) methodology. High skill occupations are those of managers, professionals, technicians and associate professionals. Medium skill workers are clerical support workers, service and sales workers, skilled agricultural, forestry and fishery workers, craft and related trades workers, plant and machine operators, and assemblers. Low skill workers are those in elementary occupations. Data for 2014 are estimates (e). Data for 2015–2019 are projections (p). Source: GEM Report team calculations based on ILO (2015c).

In high income countries such as the United States, an insufficient supply of tertiary graduates is well documented, as evidenced by the rising ‘college premium’ in wages and growing inequality (Goldin and Katz, 2010). On the global scale, by 2020 the world could have 40 million too few workers with tertiary degrees, relative to demand, and up to 95 million too many low and medium educated workers. Advanced economies could have up to 35 million excess workers without post-secondary education. In poorer countries the surplus of workers without secondary education could be as large as 58 million, combined with 45 million too few workers with secondary education (MGI Global, 2012).

Beyond the need for greater tertiary enrolment, what forms of skills development should governments promote? There is a case for expanding TVET at the post-secondary level in middle skill occupations that are less prone to automation (Autor, 2015). Investing in job-specific skills is risky given the uncertainty as to the effects of technological change. Still, capacities promoted by general and comprehensive education – for example, critical thinking, problem solving, team and project work, and solid literacy, communication and presentation skills – are likely to

remain valued in the labour market, including in green jobs, and throughout life.

In addition, education systems could do more to promote high value skills not easily replicated by machines or software. Studies based on analysis of job tasks in the UK and US labour markets show that two attributes in particular are the least likely to be replaced by machines: originality and social intelligence. The former – and most important – attribute refers to creative problem-solving and the generation of unusual or clever ideas about a given topic or situation. The latter entails tacit knowledge of social and cultural contexts enabling one to perform tasks such as negotiation, coordination, teaching and mentoring (Citi GPS, 2016; Frey and Osborne, 2013). Acquiring a wide range of transferable and foundation skills is therefore extremely important for future employment. The challenge for education systems is to discover how to most effectively impart them to students.

Countries need to make the leap to the high skill service sector

The decline of medium skill work, particularly manufacturing employment, has strong implications for lower income economies. In almost every country

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By 2020, the world could have 40 million too few workers with tertiary degrees, relative to demand

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that has moved from low to high income status, manufacturing jobs provided the route by which poor agrarian workers moved into comparatively stable and better paid work. However, automation and technological developments are reducing demand for manufacturing workers, a trend expected to continue. Without growing manufacturing employment, the challenge of ‘leapfrogging’ from low skill agrarian to high skill service-sector economies is daunting for poorer countries and regions in which the majority of employment is still agricultural, such as sub-Saharan Africa and Southern Asia (World Bank, 2015).

Over the course of the 20th century, peak manufacturing employment in emerging economies has declined, relative to the historical experience of more advanced economies. Manufacturing employment in the United Kingdom peaked at 45% of total employment, while emerging economies such as Brazil and India saw manufacturing employment peak at no more than 15%. In sub-Saharan Africa, manufacturing employment has stagnated at around 6% for three decades (Citi GPS, 2016).

Countries which have not already developed a strong manufacturing sector face significant barriers. The decreasing cost of automation technology means that the abundance of cheap labour in, for example, sub-Saharan Africa is unlikely to provide sufficient incentive for manufacturing firms to invest (Citi GPS, 2016). So, as a form of ‘premature deindustrialization’, such nations are transforming into service economies without prior development of an industrial sector (Felipe et al., 2014; Rodrik, 2015).

This is already evident on a global scale: Employment in the service sector has grown substantially (ILO, 2015b). However, many of these jobs are characterized by low productivity and poor working conditions. In Latin America, work in the informal sector³ has grown; in sub-Saharan Africa, urban migrants are crowding into subsistence employment in the informal service sector as well (Rodrik, 2015).

High productivity tradable service industries such as ICT and finance could provide an alternative means of growth in the absence of a manufacturing sector (Rodrik, 2015). So could jobs in growing green industries. But the highly educated and skilled workers upon which these sectors rely are typically in short supply in lower income countries. Nor is the shift to high value services such as ICT automatically positive, as it can have negative effects such as social exclusion and job insecurity (see Chapter 5: Place).

Policy-makers need to extend provision of education and skills beyond the basic literacy and numeracy that were valued in 20th century industry. The extent to which countries create conditions in which services and green industries can productively employ large numbers of workers will largely determine whether governments meet commitments to provide work for all. Countries hoping to emulate the export-led manufacturing growth of ‘Asian miracle’ economies may need to accept that this model now offers limited guidance.

ECONOMIC GROWTH DOES NOT MEAN PROSPERITY FOR ALL

Achieving a higher level of development has historically been linked with industrialization. But as the Agenda for Sustainable Development was being defined for 2015–2030 and the evidence of prior decades was considered, fundamental flaws became visible in the logic of economic growth reliant on the 20th century model of industrialization. These flaws concerned not only the impact on the environment but also the fact that such models of economic growth have failed to produce development that is inclusive of all (Sachs, 2015).

The previous sections presented evidence that investing in education and lifelong learning contributes to long-term economic growth and that education (and policies on education and skills development) can facilitate countries’ ability to expand the higher skill service sector and provide decent work for all. But economic

growth does not necessarily mean prosperity for all, in spite of the great strides made to improve the quality of life around the globe and reduce extreme poverty. The benefits of growth have been unevenly spread. The effects on the environment have meant a poorer quality of life for many, and thus a lack of prosperity. In addition, poverty remains prevalent in many countries.

While the incidence of extreme poverty declined rapidly over 2000–2015, the challenge is far from over. Almost 900 million people lived in extreme poverty in 2012. The share of people living on less than US\$1.90 a day declined globally from 29% in 1999 to 13% in 2012, partly because of rapid economic development in China. Extreme poverty is now concentrated in Southern Asia (19% of the population) and sub-Saharan Africa (43%) (World Bank, 2016).

For those who are in work, earnings are often not sufficient to escape either extreme poverty or more moderate levels. In low income countries, largely in sub-Saharan Africa, 37% of workers are extremely poor and a further 32% moderately poor. More broadly, almost 90% of workers are either poor or close to poverty in low income countries, and nearly 70% in lower middle income countries. Among all developing regions, almost half of workers are poor or near poverty (**Figure 1.2**).

Inequality, as measured by the Gini coefficient, has persisted at an extremely high level globally, and has increased markedly in most countries and regions.

The Gini index measures per capita income equality: The closer the coefficient is to zero, the less the inequality, and the closer it is to one, the greater. The global Gini coefficient was 0.715 in 1998 and had not changed significantly by 2008, at 0.705 (Lakner and Milanovic, 2015).

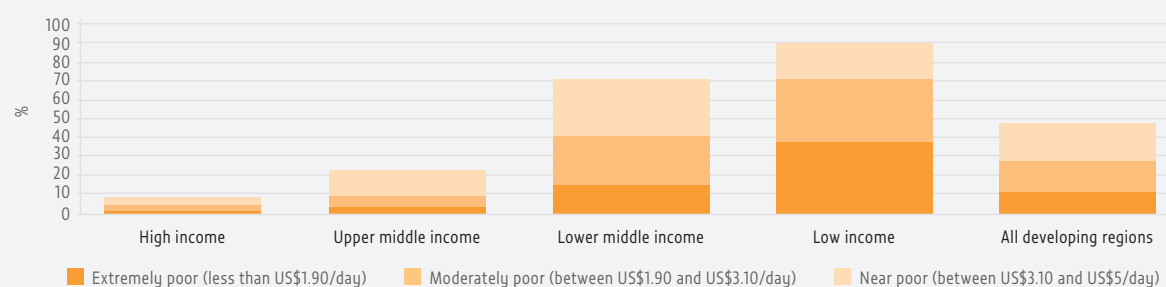
Between 1993 and 2008, the poor did not benefit from growth as much as the rest of the population: The average per capita income of the world's poorest decile increased by 25%, but the income of the middle deciles grew roughly twice as fast, by over 50%, while the income of the richest 1% grew by 62% (Lakner and Milanovic, 2015).

Within countries, increases in inequality were more pronounced. By income group, average inequality increased significantly between the early 1990s and late 2000s: by 9% for high income countries and 11% for low and middle income countries (**Figure 1.3**). Over 1988–2008, inequality increased rapidly in China (Lakner and Milanovic, 2015).

The evidence on poverty and inequality shows that economic growth has not been equally shared and that the conventional development paradigm needs rethinking. The growth model of the past century is not suited for 21st century sustainability, even if it does include the aim of reducing extreme income poverty by raising GDP. A new concept of prosperity must include social inclusiveness of economic institutions and overall

FIGURE 1.2:

Large proportions of workers remain in poverty
Share of workforce living in or near poverty, 2015



Notes: Excludes North America, Western Europe and the European Union, Australia and New Zealand. Economic classes are defined by estimated per capita per day consumption levels in US\$, 2011 Purchasing Power Parity (PPP).
Source: ILO (2016).

well-being, along with environmental sustainability of production and consumption. A strong economy does not just grow but is also inclusive and sustainable.

In the past, growth has been tracked through gross measures such as increases in domestic product, without careful examination of its impact on the environment or the extent to which the vital economic activities of marginalized groups, such as the poor and women, are included. Looking beyond a nation's averages is critical to understand how all citizens contribute to and are affected by economic growth; doing so helps keep poverty and inequality from persisting at levels that undermine social cohesion (Ravallion, 2015).

In fact, high and rising inequality has stalled progress in much of the world. Drawing on data from OECD countries over the past 30 years, analysis suggests that in relatively rich countries, the single biggest negative impact on economic growth was made by the widening gap in income between the lower middle class and poor households, on one hand, and the rest of society on the other (Cingano, 2014).

EDUCATION CAN HELP INCREASE INCLUSION

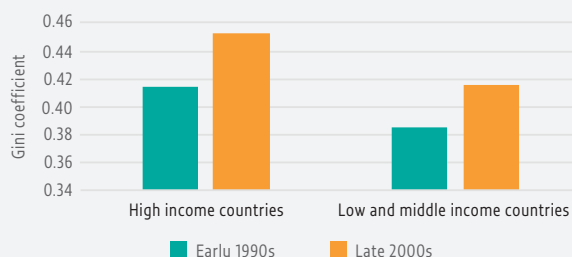
Education has an important role in creating a stronger relationship between expanding valued economic activities and promoting social inclusion as part of the process of transition to a sustainable and inclusive economy.

Education drives growth, increases the incomes of the poorest and, if equitably distributed, mitigates inequality. Making primary and secondary education of good quality widely accessible can enable large numbers of individuals and their families to increase their incomes above the poverty line. In lower income countries, achievement of basic education is associated with increased earnings and consumption among rural and informal sector workers. Calculations for the 2013/14 *EFA Global Monitoring Report* showed that if all students in low income countries left school with basic reading skills, 171 million people could be lifted out of extreme poverty, equivalent to a 12% reduction in the world total (UNESCO, 2014).

Higher levels of education reduce the likelihood of households experiencing long periods of chronic poverty or transmitting poverty between generations. If 10

FIGURE 1.3:

Inequality has grown across rich and poor regions
Change in Gini coefficient between early 1990s and late 2000s



Notes: Household income inequality was measured by the population-weighted average for a sample of 116 countries.
Source: UNDP (2013).

recent EU member states⁴ met 2020 targets to decrease early school leaving and increase tertiary participation, they could reduce the numbers of those at risk of poverty by 3.7 million (Ajwad et al., 2015). Education can also help make the labour market more inclusive by facilitating labour force participation and employment, and reduce working poverty as well.

However, assumptions on the role of education in economic development can often be overly reductive. The term 'education' encompasses a wide range of programmes, with differing levels of quality and objectives. The effects of a particular education investment in terms of desirable outcomes will accordingly vary in magnitude. Moreover, these effects will in turn vary across countries, depending on broader economic and labour market contexts. Looking more closely at the effects of levels and types of education across a range of outcomes can therefore be instructive in helping promote more participation in the economy, and more inclusion in its benefits.

EDUCATION'S IMPACT ON INEQUALITY MAY BE MIXED

While expanding education is indispensable to the fight against poverty, its impact on inequality is mixed. Increases in training and skills have not translated evenly into improved prospects for long-term economic growth or reduced social inequality. The impact of education varies by country context. Secondary or tertiary education is becoming key to obtaining decent

jobs and decent earnings, even in low and middle income countries. This trend is reinforced by job polarization and by the rise of the service sector in the context of rapid technological change and continued globalization.

Equitable education expansion over 2015–2030, especially at the secondary and post-secondary levels could help reverse the trend of widening income inequality within countries. Educated people, at all levels of education, receive a substantial payoff in individual earnings (Montenegro and Patrinos, 2014), meaning education reforms can be important in reducing income inequality and earnings disparities between groups. Furthermore, improving education outcomes among disadvantaged groups can improve intergenerational social and income mobility (OECD, 2012).

Generally, to tackle income inequality, education should be expanded and its provision equally distributed. Historical evidence suggests unequal distribution in educational attainment contributes to unequal income distribution (Birdsall and Londoño, 1997; Gregorio and Lee, 2002; Lundberg and Squire, 2003), while higher levels of education, in terms of both quality and quantity, positively affect growth in the income share of the poor (Gundlach et al., 2004). A meta-analysis of 64 empirical studies found that education – based on measures such as years of schooling and education expenditure – is significantly associated with an increased income share of the poor and a reduced income share of the rich. Effects were particularly strong for secondary school expansion, and for education expansion generally in Africa (Abdullah et al., 2015).

While reporting an overall positive effect, the meta-analysis cited above found that education was associated with increased inequality in a large number of studies (Abdullah et al., 2015). In the United States, it is estimated that moving 10% of non-college-educated males to a

“Where education is unequally distributed and not effectively aligned with labour market designs, it can reinforce inequality”

degree-level education would have little impact on overall inequality⁵, mainly because many benefits would shift to the upper end of the income distribution (Hershbein et al., 2015).

The overall effect of education expansion on income inequality

(before taxes and transfers) is ultimately determined by changes in the education distribution between levels of education; differences in labour market returns between (and within) these levels;⁶ and whether the education expansion reduces differences in wages between education levels.

The dynamics of education expansion are commonly understood in terms of two sometimes contradictory processes – the *composition* effect and the *compression* effect (Gregorio and Lee, 2002; Knight and Sabot, 1983). The former, through increases in the incomes of beneficiaries, changes income distribution, and in theory can either increase or decrease inequality. For example, on this basis, education expansion in which beneficiaries increase their incomes significantly above average wages (e.g. expanding tertiary education in a country in which only a small proportion of the population has tertiary education) can be expected to increase inequality, all else being equal. On the other hand, education expansion in which a disadvantaged group increases its income to closer to the national average (e.g. moving to universal secondary attainment where attainment is relatively widespread) can be expected to lower inequality. Hence, the composition effect of education expansion at a given level of education tends to increase inequality initially, as more people attain higher income, then lower it over time, as fewer low income people remain.

At the same time, a *compression* effect takes place when the increased supply of workers with a given level of education exceeds the demand for them. This pushes wages down relative to the less educated. So while the composition effect can work to either increase or decrease inequality, the compression effect works to lower inequality. All else being equal, the effect of education expansion on earnings inequality depends on the net composition and compression effect. If, for example, a higher education expansion led to a compositional change – which would in theory widen the income distribution – this would have to be outweighed by a subsequent compression effect across higher education graduates in order to decrease inequality.

Given uncertainty of the future returns between and within various levels of education and labour market demand, accurately estimating the net composition and compression effects of an education reform in advance is challenging.

Education should therefore be viewed as a potential equalizing mechanism, but not as the sole solution to

inequality. The degree to which education can decrease income inequality within countries over 2015–2030 will vary by countries, depending on context. Opportunities for large expansion of secondary education that could equalize income exist in many low income countries. Yet many countries, including in poor regions, will likely experience ever-increasing demand for tertiary education, both as a result of larger numbers graduating from secondary school and from employers wanting skilled workers (Altbach et al., 2011). If changes in the economy raise the pay-off to tertiary education, while tertiary graduation increases alongside, income inequality could widen in many countries.

Governments have an obligation to provide universal primary and secondary education and basic skills to all. But whether increased access to tertiary education improves income distribution over the short and medium term should not ultimately determine its desirability. Education is not the only tool available to policy-makers wishing to tackle inequality. Counteracting inequality with taxes and transfers between those on high and low incomes remains a necessary and often more effective method than education reform alone (Hershbein et al., 2015). Better access to education (leading to declining education inequality), combined with improved health outcomes and redistributive social policies, have been cited as three interventions that help raise the income share of the poor and middle class regardless of the level of economic development (Dabla-Norris et al., 2015).

EDUCATION IMPROVES LABOUR MARKET AND DECENT WORK OUTCOMES

The primary way education promotes economic inclusion is by expanding people's ability to participate productively in the economy on favourable terms. This objective, implicitly including poverty reduction and greater income equality, is encapsulated in SDG 8: promoting inclusive and sustainable economic growth, employment and decent work for all.

Decent work is both an aspiration and an expectation for the vast majority of working age adults, who depend on a decent wage for their labour (**Box 1.2**). However, widely available measures make clear that decent work remains out of reach for much of the global working population.

Education is widely considered one of the best investments to expand prospects of skilled and

BOX 1.2

What is decent work?

The ILO concept of decent work describes it as work that is 'productive and delivers a fair income, security in the workplace and social protection for families. Decent work means better prospects for personal development and social integration, and freedom for people to express their concerns, organize and participate in the decisions that affect their lives. It entails equality of opportunity and treatment for all women and men.'

Education primarily promotes decent work by enabling individuals with skills and knowledge to become more productive.⁷ More specifically, it enables individuals to acquire a stock of capabilities (knowledge and skills) necessary to perform certain tasks effectively. Workers apply their skills to bundles of tasks (occupations) in order to produce output. Skilled workers can perform a variety of complex tasks more effectively, thereby producing more value and receiving higher earnings. Due to their relative scarcity, higher skill workers are more employable and demand not only higher earnings in the labour market, but also better working conditions. Higher skill work is often intrinsically more rewarding because of the freedom and creativity often inherent to higher skill occupations.

Sources: Acemoglu and Autor (2011); ILO (2007).

adequately paid employment. But while most policy-makers are aware of the importance of education for productive and decent work, it is less clear what forms of education expansion should be promoted to maximize better job opportunities. In addition, following the earlier discussion, it will be important for education to equip workers with green skills, for the new green economy.

EDUCATION CAN FACILITATE LABOUR FORCE PARTICIPATION AND ACCESS TO EMPLOYMENT

Globally, many individuals remain unable to secure work, or do not participate in the labour market. The share of the population in employment varies significantly across regions. It is systematically lower among women than men, particularly in Northern Africa and Western Asia and Southern Asia (ILO, 2015b).

In 2014, 201 million people globally were considered unemployed: that is, without work, though available for and seeking employment. Youth continue to be

disproportionately affected, accounting for over one-third of the unemployed globally (ILO, 2015b). Some regions display considerable gender disparity, including Latin America and the Caribbean, sub-Saharan Africa and, in particular, Northern Africa and Western Asia, where 21% of women are unemployed – almost double the share of men. Underemployment is also significant. In the European Union, 10 million are underemployed, two-thirds of them women (Eurostat, 2015). Unemployment figures exclude those who have stopped actively seeking work, often because they cannot find employment or have given up. In 2013, the number of these ‘discouraged workers’ was estimated at 23 million globally (ILO, 2014).

Education can have a significant role in facilitating employment, as reflected in lower unemployment rates among the comparatively educated, particularly in richer countries. However, in poorer countries this relationship often breaks down, suggesting both that demand for skilled labour is limited and that education systems are not enabling students to acquire relevant skills (ILO, 2015a; Sparreboom and Staneva, 2014).

In richer countries, low educational attainment has a strong association with unemployment and inactivity. In the OECD, only 55% of adults aged 25 to 64 with less than an upper secondary education were employed in 2013, compared with 73% of those with an upper secondary or non-tertiary education and 83% with a tertiary qualification (OECD, 2015c).⁸ The corresponding rates among those aged 15 to 29 who were not in education were 49%, 73% and 83% (OECD, 2015b).

Evidence across 11 EU countries shows that the probability of long-term unemployment decreases with higher educational attainment (Garrouste et al., 2010). In emerging economies such as South Africa and Turkey, there are large differences in employment rates by educational attainment. In South Africa, less

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Evidence across 11 EU countries shows that long-term unemployment decreases with higher educational attainment
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than 45% of the adult population with less than upper secondary education were employed in 2005, compared to over 60% who completed upper secondary, and over 80% with a tertiary qualification (Quintini and Martin, 2013). In the United States, high

school and university completion significantly increases the chance of unemployed workers finding work within a year (Riddell and Song, 2011).

By contrast, unemployment in non-OECD countries is often associated with higher levels of education. In Asia and the Pacific, North Africa and Western Asia, and sub-Saharan Africa the youth unemployment rate increases with the level of education. Youth with tertiary education in these regions are two to three times more likely to be unemployed than youth with primary education or less (ILO, 2015a). In several sub-Saharan African countries, differences are especially large among young adults aged 25-34. In the United Republic of Tanzania, for example, unemployment is almost negligible among those with primary education or less, but almost 17% for those with tertiary education (UCW, 2013). Such outcomes are partly due to the more educated coming from wealthier backgrounds and thus able to sustain periods of unemployment, whereas employment is necessary for survival among the poorer and less educated (UCW, 2013).

High unemployment rates among the relatively educated – particularly among youth – also reflect low education quality, weak skills acquisition and limited labour demand. In Northern Africa and Western Asia, where youth unemployment is pervasive, education quality is low, as indicated by the fact that some 75% of eighth grade students scored poorly on international mathematics tests. Tertiary enrolment is also weighted towards subjects with relatively low labour market demand (particularly law, the humanities and business/commerce). These factors may explain why almost 40% of firms in Northern Africa and Western Asia – the highest share of any region – identified an inadequately educated workforce as a major constraint to growth (Gatti et al., 2013).

TVET is often promoted as a potential solution to youth unemployment, facilitating school-to-work transition by providing skills more relevant to the labour market. However, the evidence is mixed: While some studies indicate that vocational education increases youth employment, the consistency of the finding in different settings and over the life course varies (Hanushek et al., 2011; OECD, 2015b).

There is a limit to the extent countries can educate themselves out of unemployment. In poorer countries, high unemployment rates among the educated likely reflects limited demand for skilled labour, amplified by

large and growing youth populations (ILO, 2015a). In advanced economies, unemployment has always been a feature to various degrees; all else being equal, it is questionable whether educating the unemployed to minimum standards would lead to full employment. So it is important for education interventions to be accompanied by economic policies that aim to increase demand for skilled labour.

EDUCATION, ESPECIALLY SECONDARY AND TERTIARY, CAN ADDRESS PERVASIVE WORKING POVERTY AND JOB INSTABILITY

This chapter has already described how working people's earnings often do not allow them to escape poverty. Almost half of workers in developing regions are in or near poverty, with considerably higher proportions in low and lower middle income countries (Figure 2.2).

Even higher shares of workers are in 'vulnerable employment': they work on their own account or with one or more partners, or they are unpaid family workers. Beyond low income, vulnerable employment is associated with a lack of social protection and unstable working conditions. It was estimated to account for

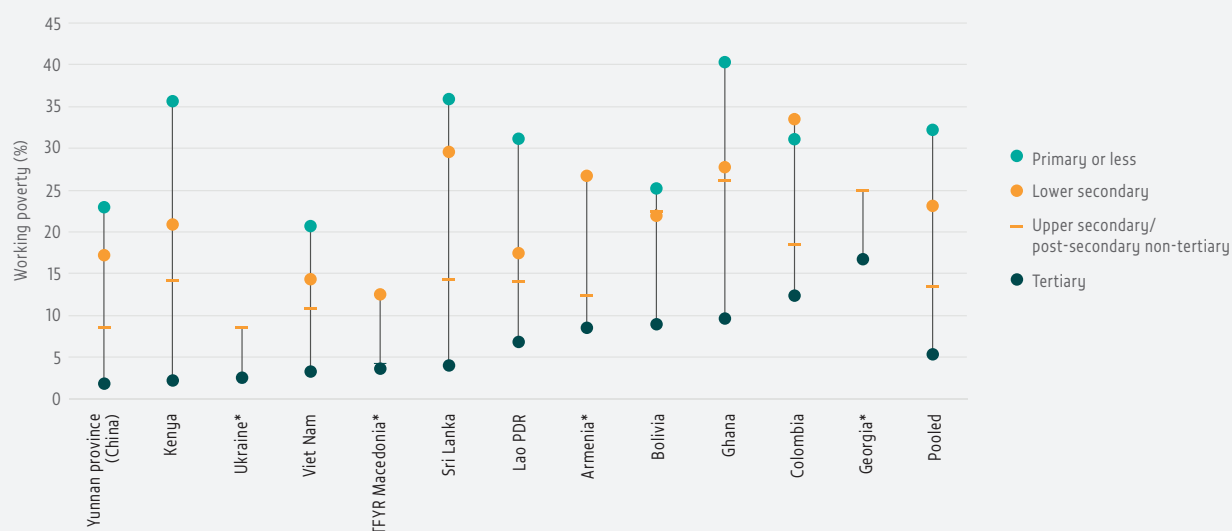
45% of global employment in 2014 (ILO, 2015c), and 75% of workers in sub-Saharan Africa and Southern Asia. Women tend to be over-represented in vulnerable employment in most regions. Even higher proportions of workers are estimated to work informally, operating outside legislative frameworks and lacking employment protection. Evidence suggests that in many low and middle income countries, over half of non-agricultural employment is informal, particularly in sub-Saharan Africa and Southern Asia, as well as many Latin American countries (ILO, 2013b).

Increasing levels of education are progressively associated with lower working poverty rates, as illustrated by analysis of twelve low and lower middle income countries surveyed in the Skills Towards Employment and Productivity (STEP) programme (Figure 1.4)⁹. Attainment of upper secondary education¹⁰ considerably reduces the likelihood of working in poverty compared to lower levels of education. Indeed, this advantage appears clear in comparison to lower-secondary attainment in most countries sampled. Those with tertiary education are least likely to be working in poverty, by a substantial margin.

FIGURE 1.4:

Increasing levels of education are associated with lower working poverty

Working poverty (below 50% of median weekly earnings) by education level in 12 low and middle income countries



Notes: Sample is for urban areas. Sample restricted to full-time workers (at least 30 hours per week) aged 15–64. *Levels of education were excluded due to low number of observations.

Source: GEM Report team calculations based on World Bank STEP Skills Measurement Surveys (2012–2013).

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Globally, earnings increase by approximately 10% for each additional year of schooling

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The benefits of upper secondary attainment and the equivalent are even more apparent when examining other measures of poor working conditions in low and middle income countries (**Figure 1.5**). Those with upper secondary education are significantly less likely than workers with lower secondary to be in vulnerable employment or to work informally without a contract or social benefits. This would suggest that upper secondary education can increase access to more productive occupations with decent working conditions. For this to hold true, any future increases in upper secondary attainment should be accompanied by growing opportunities in the labour market to productively utilize these skills.

However, vulnerable and informal employment remains sizeable in the low income countries of the sample, even among workers with upper secondary education. In the Plurinational State of Bolivia and Colombia, informality and own-account employment remain relatively widespread even among workers with tertiary education. Informality is partly driven by efforts to avoid

taxes and regulations. But widespread employment in low productivity small and micro-enterprises, largely reflects limited employment opportunities in larger formal sector firms (La Porta and Shleifer, 2014). Unless measures are taken to promote the growth of larger, higher productivity firms (which in addition to offering better working conditions are more likely to comply with regulations), the effects of education expansion may be muted in some countries (Herrera-Idárraga et al., 2015). However, since vulnerable employment has been growing in recent years, including in OECD countries (ILO, 2015b; Jütting and Laiglesia, 2009), it is questionable whether employment can be significantly ‘formalised’ by 2030.

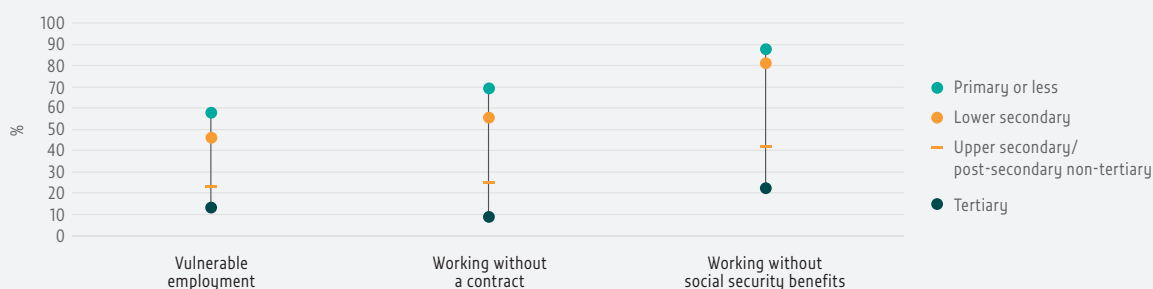
EDUCATION SIGNIFICANTLY INCREASES EARNINGS AND EMPLOYMENT

Beyond reducing poverty, education has a well-established effect on earnings across the income distribution. Globally, in 139 countries, the private return¹¹ per additional year of schooling is 10%. Rates of return are highest in poorer regions such as sub-Saharan Africa,

FIGURE 1.5:

Upper secondary attainment can substantially lower the risk of vulnerable and informal employment

Vulnerable and informal employment in urban areas by educational attainment



Notes: For urban areas of Armenia, the Plurinational State of Bolivia, Colombia, Georgia, Ghana, Kenya, the Lao People's Democratic Republic, Sri Lanka, the former Yugoslav Republic of Macedonia, Ukraine, Viet Nam and China (Yunnan province). Vulnerable employment is defined as the sum of own-account workers and contributing family workers. Data are for 2012–2013, weighted by population.

Source: GEM Report team calculations based on World Bank STEP Skills Measurement Surveys (2012–2013).

reflecting the scarcity of skilled workers (Montenegro and Patrinos, 2014).

In recent years, international surveys directly measuring skills among youth and adults have shown that literacy, numeracy and problem-solving abilities have a significant impact on earnings. For example, in 22 OECD countries, a standard deviation increase in literacy and numeracy skills is associated with an average increase in hourly wages of 17% and 18%, respectively¹² (Hanushek et al., 2013). Among urban populations in eight low and middle income countries, the increase in hourly earnings associated with a standard deviation increase in literacy scores ranges from 9 percentage points in Ukraine to about 25 percentage points in Ghana and Kenya (Valerio et al., 2015).¹³ In both OECD and lower income countries, returns are highest among prime-age workers (35 to 54), who presumably are more able to apply their skills in employment (Chua, 2015; Hanushek et al., 2013).

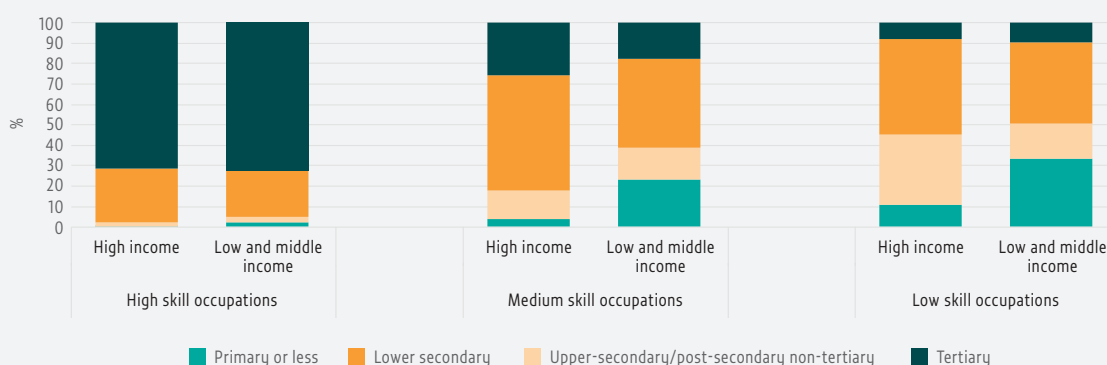
Differences in returns to literacy skills on earnings between richer and poorer countries suggest their relative scarcity in the latter. For example, in the Plurinational State of Bolivia, Ghana and Kenya, the returns to literacy are the highest in the World Bank

STEP Skills Measurement Survey sample, but the literacy scores are the lowest, with the majority of adults possessing not even basic literacy skills of at least level 2 (Valerio et al., 2015). Nevertheless, there is considerable scope to improve literacy even in OECD countries, where large proportions of adults do not possess more developed skills above level 2 (OECD, 2015a).

Facilitating employment in higher skill occupations is an important route through which education increases earnings. It enables workers to perform a range of complex tasks inherent to higher skill work. In OECD economies, workers in managerial, professional and technical occupations have, unsurprisingly, the highest earnings by some margin compared to those in lesser skilled occupations (De La Rica and Gortazar, 2016). Analysis of STEP survey data shows similar patterns for the low and middle income countries sampled.

However, upper secondary education on its own does not appear to facilitate access to high skill occupations; instead tertiary education is likely a necessity. The education profiles between those in high skill and lower skill work are strikingly different (**Figure 1.6**). High skill employment largely remains the preserve of those

FIGURE 1.6:
Tertiary education is largely required for employment in high skill occupations
Occupational skill by educational attainment



Notes: Low and middle income countries are Armenia, the Plurinational State of Bolivia, China (Yunnan province), Colombia, Georgia, Ghana, Kenya, the Lao People's Democratic Republic, Sri Lanka, the former Yugoslav Republic of Macedonia, Ukraine and Viet Nam. High income countries are Germany, the Republic of Korea and the United States. Data are weighted by sample target population. Only urban areas are covered in low and middle income countries. Skilled occupations are classified according to 1 digit ISCO-08 codes, following the ILO Global Employment Trends (GET) Model Extension (GME) methodology. High skill occupations are those of managers, professionals, technicians and associate professionals. Medium skill workers are clerical support workers, service and sales workers, skilled agricultural, forestry and fishery workers, craft and related trades workers, plant and machine operators and assemblers. Low skill workers are those in elementary occupations, such as cleaners, street vendors and labourers in mining, construction, manufacturing and transport.

Source: GEM Report team calculations based on World Bank STEP Skills Measurement Surveys (2012–2013) and OECD PIAAC Survey of Adult Skills.

with tertiary education, while those in medium and low skill jobs are largely educated to the secondary level or below.¹⁵ These patterns are more or less replicated across the sample of poorer and richer countries, suggesting that the education segmentation of high and medium/low skill work may be a general feature of economies regardless of income.

Educational attainment is associated with higher earnings within occupational categories, however. Analysis of prime-aged workers in full-time employment in the STEP countries shows that hourly earnings for low skill work increase with educational attainment. Among medium skill workers, educational attainment is associated with an even greater increase in earnings. High skill workers with tertiary education also earn substantially more than those with upper secondary attainment. On this basis, education expansion should lead to increases in earnings across all occupational groups regardless, but to a greater degree if it facilitates access to higher skill occupations.

The case for expanding tertiary education in developing countries is supported by recent evidence on labour market returns to education. In contrast to earlier research which found that the return to earnings was highest for a year of primary schooling, more recent global estimates show that the private returns to tertiary education exceed those to both primary and secondary education (Montenegro and Patrinos, 2014). This finding is confirmed in a smaller sample of 25 low and middle income countries (Fink and Peet, 2014).

EDUCATION CLOSES GENDER AND SOCIO-ECONOMIC EMPLOYMENT DISPARITY

In many countries, labour market outcomes are generally, and often significantly, worse among women and those with disadvantaged socio-economic backgrounds. Among the urban population of STEP countries, working poverty among women is on average double that of men, and in most countries is significantly higher for those of low-socio-economic background compared to more advantaged counterparts. Large disparities are also found in many OECD countries, such as Austria, Finland, the Republic of Korea and Switzerland, where the incidence of low pay among women is more than double that of men (OECD, 2016b). Wages among those with low socio-economic background are significantly below more advantaged counterparts in a majority of OECD countries (OECD, 2015c).

Gender disparity in vulnerable employment and informality, however, tends to differ by country and region. Among Eastern European and Central Asian countries of the STEP survey, informality is highest among men, but is higher among women in Latin American and sub-Saharan African countries.¹⁶ In the majority of countries, workers from disadvantaged socio-economic backgrounds are more likely to work informally (Chua, 2015).

Differences in education and skills can be a significant source of disparity among disadvantaged groups. In STEP countries, workers of low socio-economic background on average have two years fewer of education than those from a middle socio-economic background, and three years less than those from a high background. Literacy skills are also significantly lower than advantaged socio-economic groups in most countries (Chua, 2015).

Gender disparity in educational attainment and literacy tends to vary by country. Among urban areas in the STEP sample, female workers in Eastern Europe and Central Asia tend to have both higher educational attainment and literacy levels than their male counterparts, while the opposite is true in Latin America and sub-Saharan Africa.¹⁷ In Ghana, for example, men have over two more years of education than women, and score over 40 points higher on a 500 point literacy scale. More broadly, disparities in advanced economies across the world are lower, with men averaging 0.25 years more of education, compared to one year more among developing countries (Barro and Lee, 2013). Among the 22 PIAAC countries, differences in literacy between the genders are marginal, although men have slightly higher numeracy scores (OECD, 2013).

Given the influence of education and skills on labour market outcomes, closing education disparities can increase access to decent work among disadvantaged groups. For the STEP countries, analysis conducted for this report suggests that if workers from low socio-economic backgrounds had the same education as more advantaged counterparts, disparity in informal employment between the two groups could shrink by 37% and that in working poverty by 39%.¹⁸ Within countries where group differences in employment outcomes are statistically significant, the effect of equalizing education outcomes is even stronger. In Colombia, Ghana, Kenya and Viet Nam, educational attainment explains nearly all the disparity in informal

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If workers from poor and rich backgrounds received the same education, disparity between the two in working poverty could shrink by 39%

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employment between workers from low and high socio-economic backgrounds (Chua, 2015).

In the 22 PIAAC countries, skills account for 83% of the wage gap between low and high socio-economic status groups,¹⁹ and 72% of the gap between foreign and native-born workers (OECD, 2015c). This analysis does not, however, control for educational attainment.

In STEP countries, analysis indicates that literacy does not have a strong effect on some indicators of decent work, independent of educational attainment. Here, differences in literacy explain 16% of the disparity in informal employment by socioeconomic status, reduced to 6% when controlling for educational attainment, while there is no statistically significant impact on disparity in working poverty (Chua, 2015).²⁰

EDUCATION POLICIES CAN HELP ENSURE A SOCIALLY INCLUSIVE TRANSITION TO GREENER ECONOMIES

While green growth offers many opportunities for expanding employment, a degree of displacement is inevitable in environmentally unsustainable industries (Bowen and Kuralbayeva, 2015). Expanded lifelong learning policies are needed to promote education and training programmes that enable displaced workers to shift into new jobs without long spells of unemployment or inactivity.

In many countries, green growth may result in increased demand for low skill work. While in some contexts such employment may provide a route out of poverty, it will not necessarily be decent work. For example, some waste disposal and recycling work is precarious and hazardous, often taking place in the informal sector (ILO, 2013a). In such cases, national legislation and industrial policies have an important role in enforcing acceptable working conditions. At the same time, education policies should equip individuals with

the skills to move into more favourable occupations considered of higher value to society.

The transition to more environmentally sustainable economies will also likely increase the demand for high skill technical, managerial and scientific occupations, potentially increasing wage inequality and job polarization.²¹ An analysis of the US labour market indicates that occupations in green industries are biased towards higher skills levels than ‘brown’ industries such as coal and other mining, with work disproportionately made up of higher skill tasks (Vona et al., 2015). Thus, a concerted effort towards green growth may substantially increase demand for high skill workers. Unless education systems adapt to provide the required technical, analytic and managerial skills, wage inequality could increase.

CONCLUSION

Implementing the SDG agenda to 2030 means reorienting education vis-à-vis a fast-changing world economy. It means expanding, interrogating and exploiting education’s complex relationship with the economy. For education to contribute most effectively to reductions in poverty and inequality and to better jobs, investments should be made with careful consideration of national contexts, and in combination with wider economic and social policies.

Education and lifelong learning will also play a central part in the creation of a green and inclusive economy with sustainable models of production and consumption, and new and retooled sectors, industries and jobs. It is difficult to predict precisely what education can achieve over the next 15 years, given the uncertainties in the transition towards sustainable economies and major shifts in the world of work. Yet it is clear that education will play a critical dual role of addressing poverty and inequality while supporting the transition to a new model of sustainable development.

For this to occur, all stakeholders, from civil society and non-government organizations – often at the forefront of the fight for sustainability and inclusion – to multilateral organizations, bilateral aid agencies and all levels of government, will need to make concerted efforts to reorient systems of education, skills development, and research and innovation.

Education will remain a central component of prosperous societies. Yet its reorientation and transformation will be necessary to create green industries, to match the massive changes expected in the labour market and to ensure social inclusion. Whether defined as knowledge transmission and skills formation, as research and innovation, or as social and institutional capital, education will largely determine the ability of countries, firms and citizens to transform the economy.

ENDNOTES

1. The countries and regional groupings covered included Australia, Brazil, China, Germany, Indonesia, Norway, Mauritius, the Republic of Korea, South Africa and the United States, as well as the European Union.
2. It is predicted that the decline in medium skill employment will level off at some point, as many of these jobs depend on uniquely human interaction. Displaced medium skill workers can also move into similar level jobs in the same industry. The impact of automatic teller machines (ATMs) in US banking is illustrative: While ATM numbers grew substantially, the number of tellers actually increased slightly as reduced branch costs allowed branches to proliferate and tellers moved into sales and 'relationship banking' roles (Autor, 2015).
3. The World Bank describes the informal economy as activities and income that are completely or partly outside of government regulation and taxation.
4. Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia.
5. However, the bottom quartile of income distribution would receive an increased share of income.
6. For example, a society which hypothetically shifted from universal secondary education (but no more) to universal tertiary education would likely be more unequal due to the larger variance of wages among those with tertiary education.
7. Education attainment also acts as a signal of ability to employers, opening the door to more productive (and decent) work irrespective of the actual knowledge acquired during study.
8. The corresponding unemployment rates were 13.7%, 8.1% and 5.3%.
9. Poverty is defined relative to the median as a more comparable measure of economic contexts.
10. In GEM Report analysis of STEP/PIAAC data, upper secondary and post-secondary non-tertiary programmes are merged into a single category, and referred to as 'upper secondary' for brevity.
11. Latest available year, including foregone earnings and excluding income taxes.
12. The effect of problem-solving abilities is slightly lower at 14.3%.
13. This may underestimate the returns relative to PIAAC countries given that STEP data for waged workers are after tax and transfers, while in PIAAC countries they are before.
14. Across the STEP sample, relative to full-time, low skill workers, hourly earnings are 50% higher among medium skill employees on average, and over twice as high among high skill workers. These figures underestimate productivity, as earnings from self-employment, which tends to be higher in lower skill occupations, are reported before tax, whereas earnings from employees are after tax.
15. The value of tertiary education is reinforced by the observation that 65% of those with tertiary education in the low/middle income countries and 74% in the high income countries had high skill employment, compared with 18% and 25%, respectively, of those with upper secondary education.
16. Informal sector workers are defined here as either wage workers without social benefits, unpaid family workers or self-employed workers in an establishment with only one employee.
17. Note that in the developing world, men have on average over a year more of educational attainment (Barro and Lee, 2013).
18. Controlling for experience, gender, literacy and country effects.
19. Parental educational attainment is used here as a proxy for socio-economic status.
20. Relative to educational attainment, skills generally have less (although often significant) power to explain wages among STEP countries, while in PIAAC countries the opposite is true (Hanushek et al., 2013; Valerio et al., 2015).
21. Evidence suggests that the onset of a new wave of technological change initially creates a surge in demand for new skills, which later dissipates as codification and standardization facilitate diffusion of new best practices.



Selina Akter, second year midwifery student, plays the role of a mother as students practise postnatal care at the Dinajpur nursing institute in Bangladesh.

CREDIT: Nicolas Axelrod/Ruom

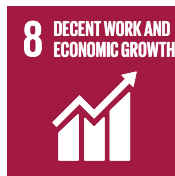
CHAPTER

2

Education, gender and work

“The achievement of full human potential and of sustainable development is not possible if one half of humanity continues to be denied its full human rights and opportunities. Women and girls must enjoy equal access to quality education, economic resources and political participation as well as equal opportunities with men and boys for employment, leadership and decision-making at all levels.”

– *The 2030 Agenda for Sustainable Development*



KEY MESSAGES

Achieving gender equality, not just in education, but also in work, is essential for sustainable development.

1 Deep rooted discrimination and disadvantages are still faced by women in the workplace the world over. Addressing this requires education.

- a. Women often do twice as much unpaid work than men, and disproportionately work in less secure positions and in the informal economy, including in agriculture, without owning lands and assets.
- b. Women and men are found in different labour market sectors. Women made up almost 70% of those choosing to major in education, but only 25% of those choosing engineering and manufacturing.
- c. Gender segregation in the labour market reduces the potential pool of talent for developing sustainable green innovation.

2 Education can increase earnings, and reduce gender gaps in informal employment.

- a. Providing inclusive education would reduce gender gaps in informal employment by 50% in Ghana, and 35% in Kenya.
- b. Non-formal education in the form of community based programmes and training can provide skills to people who have been failed by low quality education systems. This is particularly useful for women who make up almost two-thirds of the 758 million adults who lack basic literacy skills.

3 Education can help fix professional gender bias.

- a. Teachers can help break occupational stereotypes and allow students to critically reflect on gendered norms.
- b. Targeted initiatives, such as mentorships, networking and scholarships can encourage girls and women to take up science, technology, engineering and mathematics, known as the STEM subjects.

4 But education alone can't address gender inequality in employment.

Better access to public jobs, and labour market regulations such as minimum wages, dismissal restrictions and maternity protection are needed.

ACHIEVING GENDER EQUALITY REQUIRES MAJOR TRANSFORMATION

Ensuring gender equality in health, political and economic leadership and employment, not just gender parity in education, underpins the sustainable development agenda. This section analyses issues related to gender inequality and equality by focusing on three themes – work and economic growth; leadership and participation; and relationships and well-being – all of which are linked with education, gender and sustainable development. The section highlights selected gender-related challenges, practices and trends involving education, along with other dimensions of sustainable development that need to be addressed to enable progress in gender equality and the empowerment of women and girls.

EDUCATION, GENDER AND WORK

This section is taken from the 2016 Gender Review published by the *Global Education Monitoring Report* (GEM Report). The 2016 Gender Review responds to the ambitious vision of the 2030 Agenda – to realize substantive gender equality and sustainable development – by highlighting the critical role of good quality education and lifelong learning. This chapter looks at gender equality against one of the three central pillars of the 2030 Agenda: work and economic growth. It looks at the way gender inequality in work and growth is reflected and perpetuated; education's role in countering or contributing to this is explored, along with formal and informal measures designed to address these challenges.

Good quality education and lifelong learning can enable women and men to participate equally in decent work, promoting economic growth, poverty reduction and well-being for all.

Sustainable development implies inclusive economic growth focused on human welfare and planetary survival. To achieve social cohesion and transformational change, prosperity must be conceived in ways that leave no one behind.

ADDRESSING GENDER INEQUALITY IN THE LABOUR MARKET

Widespread inequality, including endemic gender discrimination in the labour market, significantly affects

“ Women fare worse than men when proxies of decent work are used to make comparisons ”

indicators used as proxies of decent work, such as the extent to which people have stable, formal employment with security in the workplace and social protection for families, or employment providing a wage above poverty level (ILO, 2007).

In many contexts, women disproportionately work in the informal economy – which is partly outside government regulation and taxation – in countries with high levels of informality (**Figure 2.1**), and in agriculture, without owning land and assets. Women also tend to be over-represented in vulnerable employment, working on their own or with one or more partners, or as unpaid family workers. Eliminating women's socio-economic

“ Informal employment is highest among men in Eastern Europe and Central Asia, but higher among women in Latin America and sub-Saharan Africa ”

disadvantage is necessary for achieving substantive gender equality (UN Women, 2015c).

Gender disparity in informal and vulnerable employment often varies by country and region. Analysis for the 2016 GEM Report using the World Bank

Skills Toward Employment and Productivity (STEP) data on the urban populations of 12 low and middle income countries found informality to be highest among men in Central Asian and Eastern European countries, but higher among women in Latin American and sub-Saharan African countries (Chua, 2016). Even wage work may not be enough to escape poverty. Across all 12 countries, women are more likely than men to be classified as working and poor (Chua, 2016). On average, working poverty among women is double that of men. Large disparity is also found in many OECD countries, including Austria, Finland, the Republic of Korea and Switzerland, where twice as many women as men work on low pay (OECD, 2016a).

Education can provide skills for work ...

Education has a well-established effect on earnings. The rates of return to education are highest in poorer regions, such as sub-Saharan Africa, reflecting scarcity of skilled workers (Montenegro and Patrinos, 2014). Formal education of good quality equips individuals with skills and knowledge to become more productive. Completion of schooling can also act as a signal of ability to employers, providing access to decent work opportunities, irrespective of actual knowledge and skills acquired during study.

In the OECD, differences in cognitive skills accounted for 23% of the gender gap in wages in 2012 (OECD, 2015b). Marked differences in labour market outcomes, such as employment rates and wages, tend to decrease among more highly and similarly educated women and men (Ñopo et al., 2012; UNESCO, 2014). But differences in educational attainment account for a significant proportion of employment disparity in some STEP countries where women are most educationally disadvantaged. Analysis suggests that equalizing

educational attainment would reduce disparity in informal employment by 50% in Ghana and 35% in Kenya, with working poverty dropping by 14% and 7%, respectively (Chua, 2016).

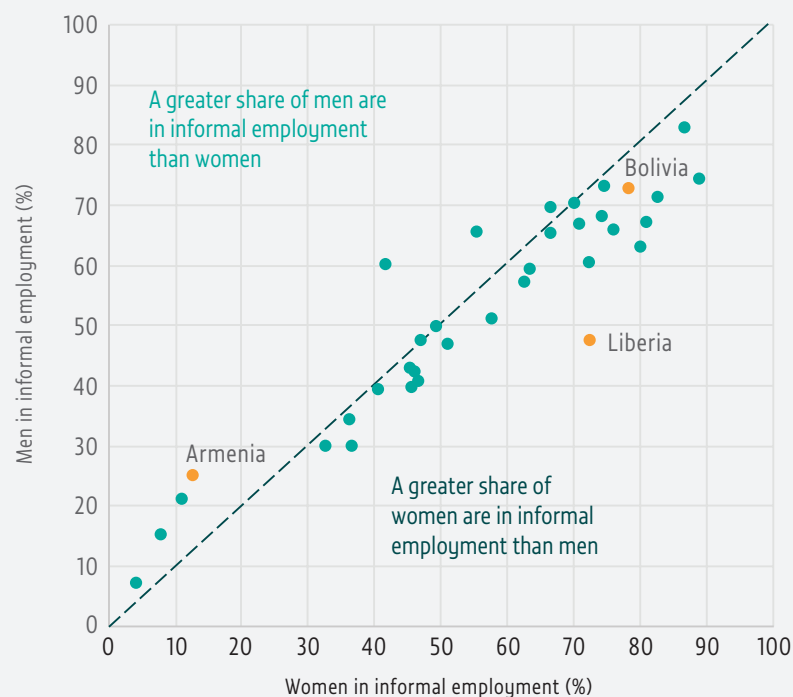
... but the links between girls' education and labour force participation are not straightforward

Achieving gender parity in education, while important, does not necessarily translate into gender equality in economic activity and employment opportunities. Countries that have seen rapid growth in education attainment among girls have not seen commensurate increases in decent work (**Figure 2.2**). In Sri Lanka, significant improvement in female enrolment and completion has not translated into workforce advantages; instead, female labour force participation has been stagnant or decreasing (Gunewardena, 2015). In Latin America and the Caribbean, improvements in girls' education at all levels have been a significant factor in women's rising labour market involvement, yet in the Middle East and North Africa, only tertiary education has had a significant effect on increasing employment

FIGURE 2.1:

Women do more unpaid work than men, and often are more likely to be employed in the informal sector

Women's and men's share of informal work in total employment, 2004–2010



Source: ILO and WIEGO (2014); United Nations (2015b).

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Empowering women requires matching education reforms with better access to public-sector jobs or laws ensuring that private employers provide decent work

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Analysis of STEP data showed that the gender gap in educational attainment did not explain gender differences in informal employment among the sampled countries; other factors, including discrimination and gendered cultural norms, were likely to contribute to women not having equitable access to stable, decent work (Chua, 2016). In Ghana, women's education and labour force participation increased from the mid-1990s, yet their wage employment stagnated and unemployment rose, along with informal economic activity and self-employment. More years of education did increase chances of wage employment (Sackey, 2005). Research suggests that empowering women requires matching education reforms with better access to public-sector jobs or laws ensuring that private employers provide decent work (Darkwah, 2010).

Non-formal education can help provide skills for work

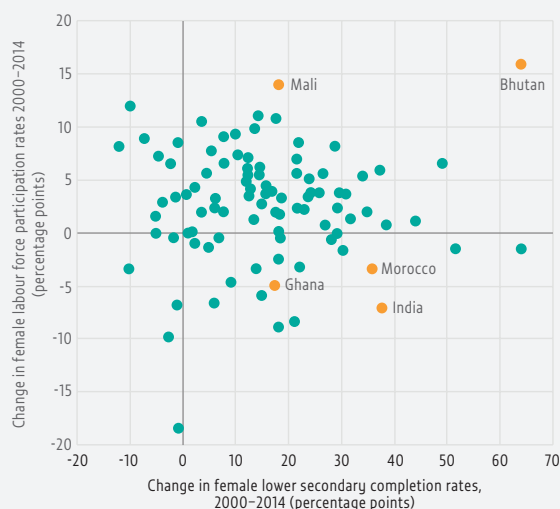
Non-formal learning opportunities tailored to local needs – community-based ‘second-chance’ programmes, microfinance initiatives or vocational training, and informal learning – can provide essential skills to young adults who have been failed by low quality education systems. Women and girls, in particular, can benefit from such programmes, as women account for almost two-thirds of the 758 million adults globally who lack literacy skills (UNESCO, 2016d).

In Egypt, the Females for Families programme identified inadequate health and education services, illiteracy, early marriage and poor attitudes towards girls as key challenges for local communities. Community-based training was provided for girls in literacy, health and other skills. Girls then established home literacy classes, which addressed daily problems; gave out health, hygiene and family planning information; trained people in cooking, crafts or agriculture; encouraged children to return to

(ILO, 2012). Similarly, high income Asian countries such as Japan and the Republic of Korea have limited female labour force participation despite high levels of education (Kinoshita and Guo, 2015).

FIGURE 2.2:
Growth in female secondary completion rates is not always linked to higher labour force participation among women

Change in female labour force participation rates and female lower secondary completion rates, 2000–2014



Sources: ILO (2016b) and UIS database.

school; and helped community and family members secure small loans and obtain identity and election cards. They became community leaders (UNESCO, 2016c).

In many countries, especially in poorer countries in Asia and Africa, women are a large share of farmers and agricultural workers but are less likely than men to have access to agricultural extension and advisory services (FAO, 2014). In India, over 250,000 women farmers have been supported since the 2010 launch of the government project Mahila Kisan Sashaktikaran Pariyojana (Strengthening Women Farmers), which trains community resource people to enable, support and build capacity among women for sustainable agricultural production (Centre for Environmental Education India, 2016).

ADDRESSING SOCIOCULTURAL GENDER NORMS FOR INCLUSIVE ECONOMIC PROSPERITY

The ways women and men participate differently in labour markets are determined not only by educational attainment but also by other influences that affect wage levels: available job types, access to resources, and bias

in markets and institutions (ILO, 2016c; World Bank, 2011). Cultural norms and discrimination limit the extent to which well-qualified women gain access to better-paid occupations and rise within work hierarchies (World Bank, 2011). Within institutions, women can find it difficult to reach senior positions, hitting a 'glass ceiling'. Relatively few women occupy leadership positions in key economic institutions. Significant pay gaps exist between women and men doing the same job in virtually all occupations (UN Women, 2015c). While women's secondary attainment is now higher than men's in many OECD countries, the gender pay gap favouring men remains substantial in many member countries (Figure 2.3).

Education can address gender bias in occupations

Analysis of occupational and educational trends shows that women and men continue to be concentrated in different labour market sectors, such as teaching (women) and information and communication technology (ICT) (men), often with different levels of status, remuneration and security (Figure 2.4). According to the International Labour Organization (ILO), such occupational segregation was decreasing until the 1990s, but has since risen (ILO, 2012, 2016c). This has mainly favoured men overall in terms of pay and status (ILO, 2016c), but not all men benefit.

Particularly in developing countries where occupational safety and health standards are weaker, men are more likely than women to work in hazardous occupations, including mining and construction, where injury, work-related diseases and death rates are higher than other occupations (ILO, 2009).

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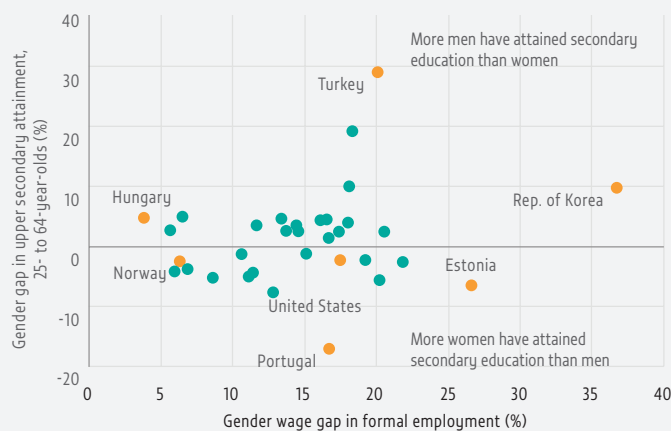
In countries with available data, the average female share in tertiary education studying education was over 68% but 25% in engineering, manufacturing and construction

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FIGURE 2.3:

Women consistently earn less than men in OECD countries, even where the gender gap in secondary attainment favours women

Gender gaps in upper secondary attainment and formal employment wages, circa 2014

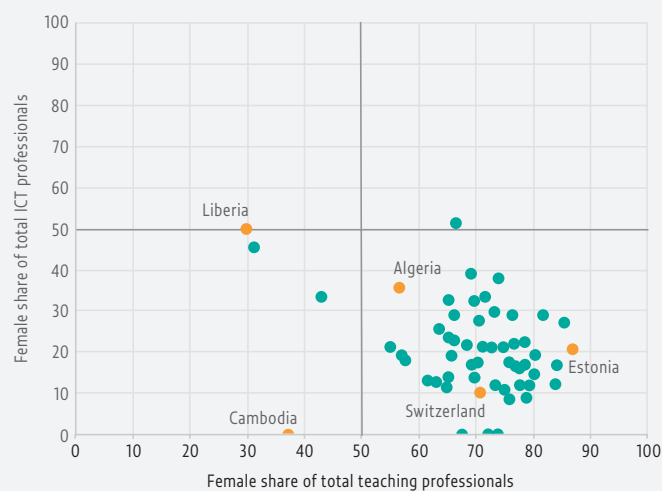


Source: OECD (2016b).

FIGURE 2.4:

Men and women work in different formal occupations

Female share of total professionals in information and communication technology (ICT) and in teaching



Note: Latest year of available data ranges from 2009 to 2014.
Source: ILO (2016a).

Occupational segregation is linked to basic education experience and subject choice at higher levels of education, which are still marked by strong gender differences. In OECD countries, only 14% of young women entering higher education for the first time in 2012 chose science-related fields of study, compared with 39% of young men. Girls are much less likely to consider a career in computer science, physics or engineering – key sectors in the knowledge economy (OECD, 2015a). In the United States in 1983/84, 37% of computer science bachelor's degree graduates were women, but by 2010/11 the share had fallen to 18% (US Department of Education, 2012). In countries with data on tertiary education subject choice, the average female share of education majors was over 68%, compared with 25% in engineering, manufacturing and construction (**Figure 2.5**).

This disparity limits women's access to key professions. It also reduces the potential pool of talent for developing sustainable green innovation (UNESCO, 2016d).

Stereotyped gender roles and expectations in school and at home partly explain educational and occupational segregation. Socialization processes, including poor career counselling, lack of role models, negative familial attitudes, perceived inability in mathematics and fear of being in the minority, may influence girls' willingness to choose specific disciplines.

Teachers can affect subject choice.

Lessons can allow students to critically reflect on gendered norms. This in turn can help break occupational stereotypes and help address gendered segregation. Targeted initiatives can encourage more gender-equitable selection of school subjects such as science, mathematics and computing (**Box 2.1**). Policies can support women's employment

While skills and education can help reduce wage differences between women and men, additional policy interventions are required, particularly for those working in low paying, less secure jobs, often in the informal sector, who would benefit more from labour market regulations such as minimum wages and dismissal restrictions.

An increasing number of countries have laws and policies to help equalize women's status at work. Virtually all countries have maternity leave legislation of some sort; most also prohibit maternity-linked discrimination, such as harassing or pressuring pregnant workers or young mothers to resign (ILO, 2014). Measures such as these improve women's

“ Only 28% of employed women worldwide are likely to receive cash maternity benefits ”

BOX 2.1

Initiatives for girls and women in STEM and STEAM

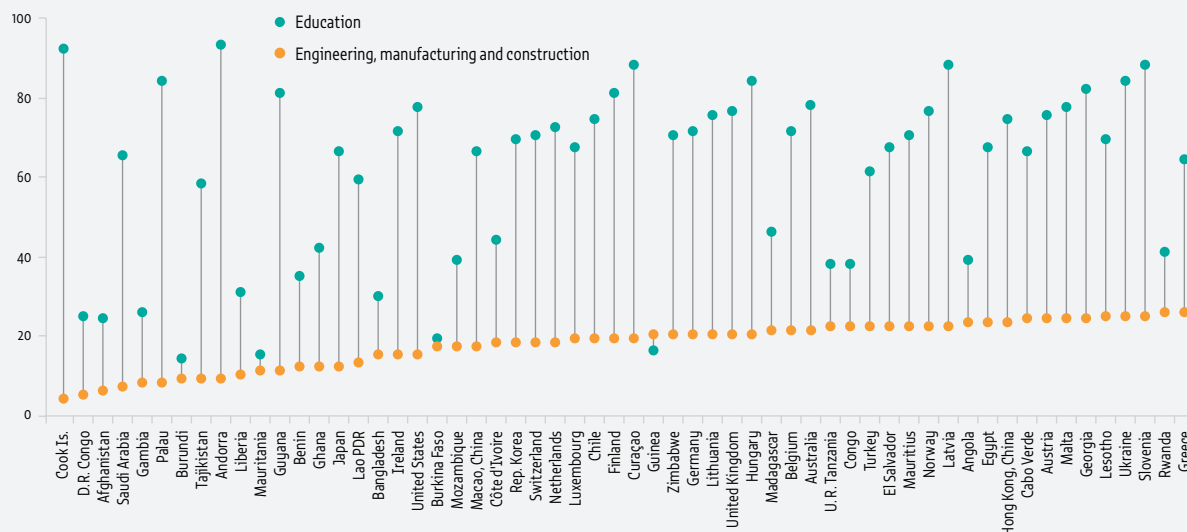
In recent decades, national initiatives have encouraged girls and women to take up science, technology, engineering and mathematics, known as the STEM subjects.

Launched in 1984, the Women in Science and Engineering campaign in the United Kingdom promotes engineering apprenticeship programmes, scholarships for women studying engineering, workshops on careers in construction and engineering, resources for teachers of STEM subjects in schools, and regional networking opportunities to help develop links between schools, universities and industry.

The TechWomen programme uses mentorship, knowledge exchange and networking to connect and support women in STEM from Africa, Central Asia and the Middle East. Participants engage in project-based mentorships at leading technology companies in the United States and are encouraged to inspire other girls and women in their communities to follow their ambitions. Since 2011, 333 women from 21 countries, including Algeria, Cameroon, Lebanon, Kazakhstan, Kenya and Zimbabwe, have participated.

In June 2016, the U.S. Mission to UNESCO and partners launched a comprehensive approach to 'STEAM' education, incorporating 'arts' (and design) in the acronym to encourage innovative cross-disciplinary skills and initiatives.

Sources: TechWomen (2016); WISE (2016); US National Commission for UNESCO (2016).

FIGURE 2.5:**More women study education than engineering, manufacturing and construction in higher education***Female share in education and in engineering, manufacturing and construction at the tertiary level, 2014*

Source: UIS database.

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Women in many countries do at least twice as much unpaid work than men

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data show only 28% of employed women worldwide are effectively protected through cash maternity benefits (ILO, 2015). And for most women working in informal jobs, maternity leave legislation is meaningless.

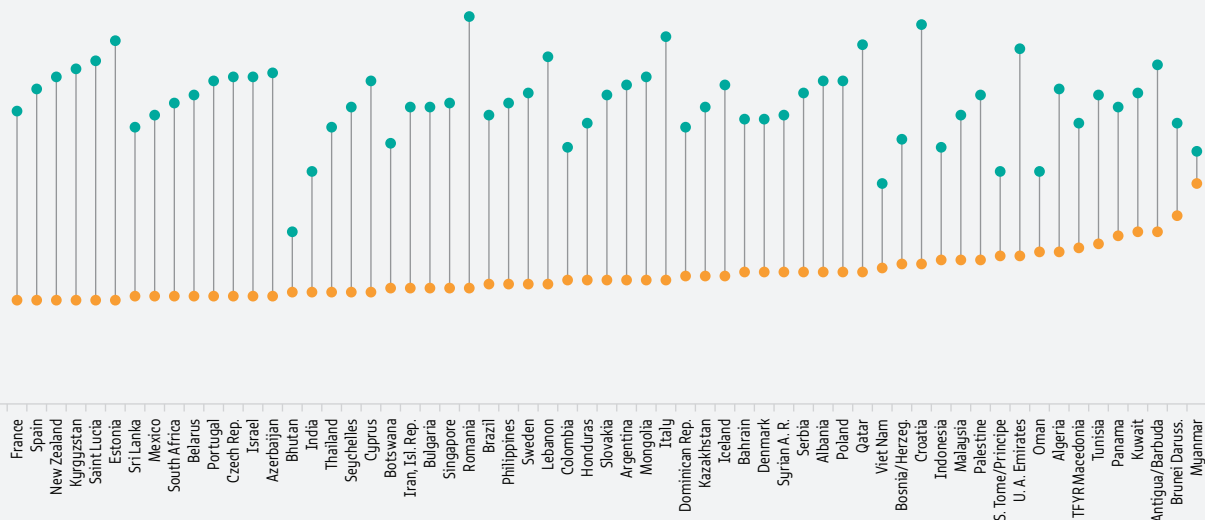
The ILO recommends maternity protection along with public spending on work–family measures, which help advance women’s opportunities for good quality work and address stereotypes of masculinity that undervalue men’s involvement in caregiving (ILO, 2014). A comparison of Finland and Norway with Japan and the Republic of Korea showed that family-friendly policies and flexible work arrangements could enable more women and men to balance work and family lives, promote fertility and encourage continued female labour force participation

employment opportunities and experiences, reduce child mortality and improve mothers’ health (ILO, 2015). However, enforcement is an issue. Recent

(Kinoshita and Guo, 2015). Some countries, including Costa Rica, Ethiopia, Mexico and South Africa, support the work–family needs of the most vulnerable by providing public child care services (ILO, 2014).

Equal parental sharing of family responsibilities should also be supported by paternal leave. By 2013, some kind of child-related leave for men in paid work was provided in 78 of 167 countries. Payment for paternity leave, where it exists, is often low (ILO, 2014). Research from countries including Brazil, South Africa and the United Kingdom shows many men are reluctant to take paternity leave due to earnings loss or fear it could damage their careers (Levtov et al., 2015; Williams, 2013). Poor allowances for and uptake of paternity leave can be linked with persistent stereotypes of women as caregivers and men as breadwinners.

Sharing parental responsibilities can challenge the gendered division of child care, empower women economically and increase gender equality in the labour force by helping mothers enter or re-enter paid employment or complete their schooling (Ferrant et al., 2014; Morrell et al., 2012; UN Women, 2008).



Women and girls continue to do more unpaid and caregiving work

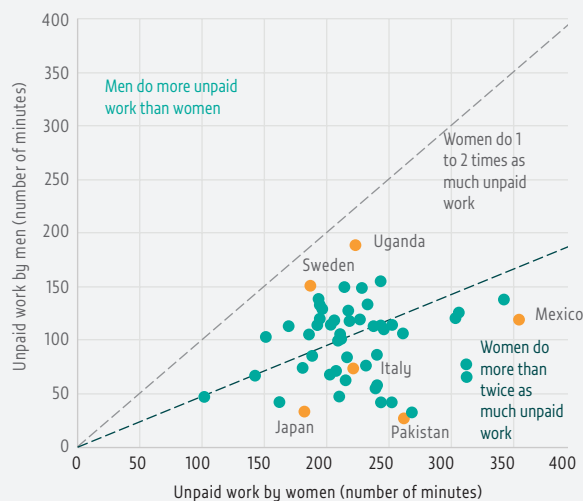
Gendered patterns of unpaid domestic and care work run deep, and seem little affected by rising levels of women's education. A study examining increased school enrolment levels for girls in Bangladesh and Malawi found no impact on the imbalance of girls' and boys' domestic work (Chisamya et al., 2012). Some see this imbalance as a root cause of women's inequality and unequal access to education, employment and public services (Razavi, 2016). Women in many countries, including Italy, Japan, Mexico and Pakistan, do at least twice as much unpaid work as men (**Figure 2.6**), and work longer hours than men in almost all countries if paid and unpaid work is combined (UN Women, 2015c).

Girls and women disproportionately bear the burden of household chores, including time-consuming tasks such as collecting water and firewood, even while in school. This affects girls' attendance and educational attainment, thus reducing equality in outcomes. In Ghana, research using four rounds of the Demographic and Health Survey (DHS) (1993/94 to 2008) found that halving water-fetching time increased school attendance by an average

FIGURE 2.6:

Women do more unpaid work than men

Time spent on unpaid work by women and men



Notes: Latest year of available data ranges from 1999 to 2013.
Source: United Nations (2015b).

of 2.4 percentage points among girls aged 5 to 15, with a stronger impact in rural areas (Nauges and Strand, 2013).

Some small-scale interventions have shown limited success in improving gender-sensitive attitudes and women's unpaid work balance. An adult literacy programme in rural Nepal increased recognition by family and community of women's unpaid work by engaging marginalized women and some men in collecting data on women's use of time. This helped achieve more equitable distribution of women's unpaid care work in some communities (Marphatia and Moussié, 2013).

Adolescent girls do more domestic work than boys, which can hinder their completion of secondary education. Overall, household survey data suggest between 40% to 80% of adolescents do some domestic chores (up to 28 hours a week) in the 17 low and middle countries with available data; the share of adolescent girls involved in domestic work is uniformly higher than boys'¹

Decent work for all requires a lifelong learning perspective

Supportive policies can promote gender equality in the labour market and should be part of an integrated approach that enables gender equality in and through formal schooling and delivers lifelong learning opportunities for all.

Formal, non-formal and informal education throughout life can contribute to substantive gender equality by providing all women, girls, boys and men with timely, responsive and relevant learning opportunities. Good quality lifelong learning opportunities are especially important for girls and women and those who have been marginalized from formal schooling, who make up the global majority of those out of school and/or lacking basic literacy.

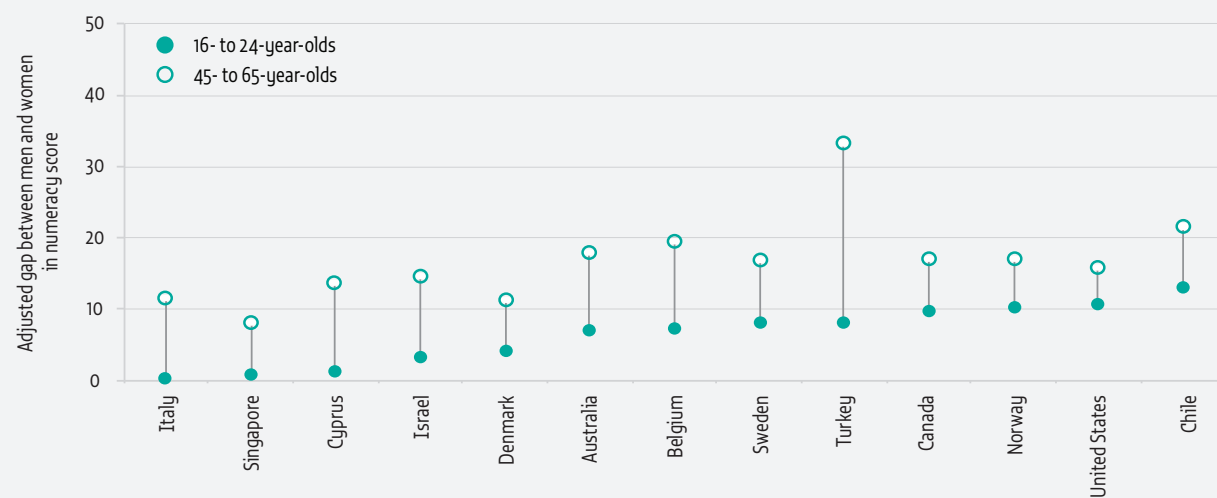
Gender gaps in basic proficiencies, such as numeracy, are much worse for older women. In OECD countries, gender gaps in numeracy are narrower among 16- to 24-year-olds than among older cohorts, even after adjusting for educational attainment. In Italy, the adjusted gender gap for women aged 46 to 65 is 11 points; among women aged 16 to 24, the gap vanishes (**Figure 2.7**).

Lifelong learning opportunities can fill the gaps of inadequate formal schooling through literacy and numeracy acquisition. Vocational training can provide skills for work, facilitate access to wage employment, improve women's status in work, and equalize pay and working conditions, e.g. by enabling women to obtain professional qualifications outside the formal education system. Lifelong learning can enhance women's financial autonomy, confidence and self-reliance, as well as their participation in other spheres of life (UNESCO, 2006).

Algeria's Literacy, Training and Employment for Women (AFIF) programme enables women to obtain professional qualifications in trades such as computing, sewing and hairdressing. It has trained and empowered more than 23,000 women aged 18 to 25, helping them with workplace integration or enabling them to generate their own income with government support (UNESCO, 2016c).

Bangladesh's TVET Reform Project, launched in 2006, provided training for women in skills for traditional and non-traditional work, including motorcycle servicing. It included a strategy for women with disabilities, with improved physical access to training institutions, which increased their self-confidence, employment and economic status. The reforms included the 2012 launch of the Bangladesh National Strategy for the Promotion of Gender Equality in Technical and Vocational Education and Training (TVET), which aimed to dismantle gender stereotypes and establish a supportive, gender-responsive environment (European Commission, 2014; ILO, 2013).

1. Child domestic work refers to household chores such as cooking, cleaning and caring for children, as well as collecting firewood and fetching water (MICS country reports). The data are available in the statistical tables of the 2016 Global Education Monitoring Report.

FIGURE 2.7:**Older women are more likely to have very poor numeracy skills***Adjusted gap between men and women in average numeracy score, by age group, 2012 or 2015*

Note: Belgium refers to Flanders only.

Source: OECD (2016c).

Young people in El Salvador take part in an activity with the Asociación SERES.

CREDIT: Ben Rosenzweig on behalf of SERES/Play for Peace



CHAPTER

3

Partnerships: enabling conditions to achieve SDG 4 and the other SDGs

We are determined to mobilize the means required to implement this Agenda through a revitalized Global Partnership for Sustainable Development, based on a spirit of strengthened global solidarity, focused in particular on the needs of the poorest and most vulnerable and with the participation of all countries, all stakeholders and all people.

The interlinkages and integrated nature of the Sustainable Development Goals are of crucial importance in ensuring that the purpose of the new Agenda is realized. If we realize our ambitions across the full extent of the Agenda, the lives of all will be profoundly improved and our world will be transformed for the better.

– *The 2030 Agenda for Sustainable Development*



KEY MESSAGES

The world must pull together to overcome barriers to achieving the 2030 Agenda for Sustainable Development

1 More domestic resources are needed to achieve the Sustainable Development Goals (SDGs).

- a. Many poorer countries still collect less than 15% of their national income in tax (compared with 26% in richer countries).
- b. Domestic and international efforts on tax evasion and avoidance are needed for countries to get the tax revenues they are owed.
- c. Resources can be channelled to education spending by reducing fossil fuel subsidies and earmarking funds for education expenditure.
- d. Aid can play a catalytic role in increasing domestic resources.
- e. Education can improve taxpayer behaviour and increase tax compliance.

2 Aid must increase to achieve the Education 2030 targets, but is declining.

- a. Even with substantial increases in domestic resources, there will be an annual finance gap of US\$21 billion in low income countries to achieve the Education 2030 targets.
- b. The education finance gap could be filled if select donors allocated 0.7% of GNI to aid, and 10% of that to education.
- c. But overall aid to education is on the decline: It fell by US\$1.2 billion in 2014 relative to its peak in 2010.

3 Aid to education is not effectively targeted to those most in need.

- a. Poor and conflict-affected countries are not adequately prioritized in aid allocations.
- b. Early childhood care and education can significantly benefit disadvantaged children but received less than 3% of the aid that goes to post-secondary education.

4 Governments and international agencies must work together to achieve the sustainable development agenda.

- a. The broad SDG agenda requires multisector approaches.
- b. Successful national efforts to improve multisector planning, while rare, usually have strong political commitment, institutional and financial support, and strong capacity.
- c. Aid agencies often lack a coherent vision of development and do not always prioritize poverty reduction.

5 The ambition of the SDGs requires partnerships if it is to be achieved.

- a. Civil society and the private sector have to play important roles in financing, implementing and ensuring mutual accountability of the new agenda.
- b. International coordination and financing bodies are critical to support countries, review progress, encourage coordination of partner activities, and leverage funds.

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The 2030 Agenda for Sustainable Development views the social, economic and environmental challenges of our time as indivisible, meaning that responses must be integrated. Sustainable Development Goal (SDG) 17, which articulates the ‘means of implementation’ for achieving the goals, calls for a revitalized global partnership. The targets under SDG 17 highlight the need for cooperation – to ensure adequate financing, develop and diffuse technological innovation, and build capacity to implement national plans; systemic improvements – to enhance policy coherence, build multistakeholder partnerships, and improve data, monitoring and accountability; and favourable macroeconomic conditions – including inclusive trade, debt sustainability and healthy investment (United Nations, 2015c).

Fulfilling the SDGs requires integrated plans and actions where diverse sectors, levels of government and types of actors have to work together. Adequate financing as well as other enabling conditions – particularly, human capacity, effective institutions and political will – are critical if the new agenda is to succeed (**Figure 3.1**). This chapter examines what changes to current financing, policy and partnership arrangements are needed within education and in its interactions with other sectors for progress to be realized.

FINANCE

No plan or strategy can be implemented without adequate financial resources. Major financing shortfalls were a key reason for the lack of sufficient progress towards the Education for All (EFA) goals between 2000 and 2015 (UNESCO, 2015a). The focus of this section is primarily on financing to achieve SDG 4 in lower income countries.

There have been several approaches to understanding what it will cost to achieve the SDGs and who should provide financing. A recent estimate suggests that an additional 1.5% to 2.5% of global gross domestic product (GDP) will need to be invested each year from the public and private sectors to achieve the SDGs by 2030. Low and lower middle income countries will need to increase expenditure by about 4% of their projected GDP (Schmidt-Traub, 2015). The Addis Ababa Action Agenda that came out of the 2015 Third International Conference on Financing for Development acknowledges that all sources of finance (public and private, domestic and international) and a long-term investment perspective will be needed (United Nations, 2015a). This is in contrast to the emphasis given to official development assistance (ODA) during the Millennium Development Goal (MDG) era (Fehling et al., 2013).

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The 2030 Agenda for Sustainable Development views the social, economic and environmental challenges of our time as indivisible

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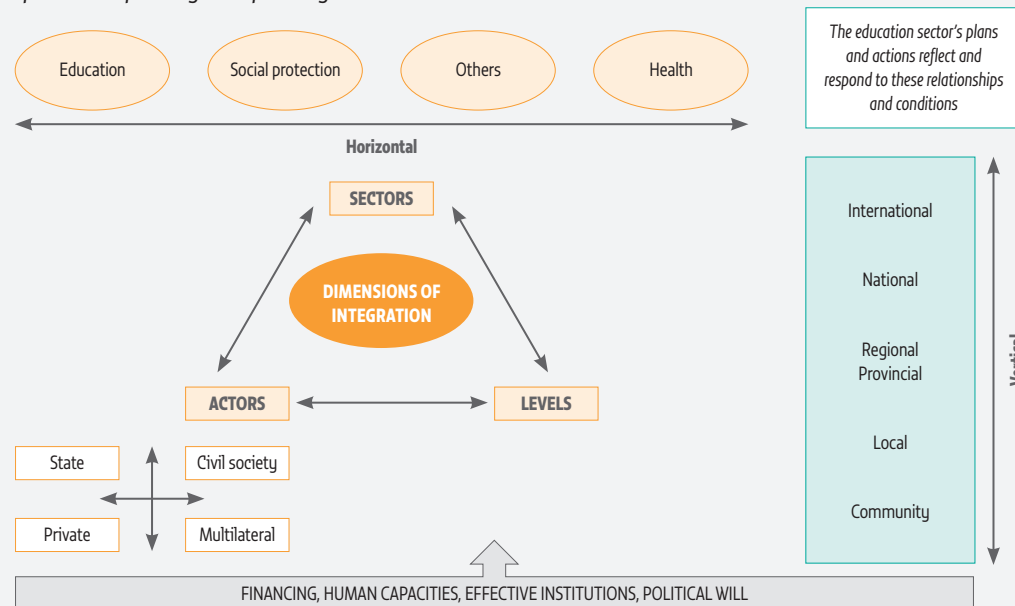
There is an annual finance gap of at least US\$39 billion per year for providing quality education from pre-primary through to upper secondary education

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FIGURE 3.1:

What type of integration and support are needed to achieve the sustainable development agenda?

A conceptual framework for integrated planning



Source: Based on Persaud (2016).

In the education sector, the 2015 *EFA Global Monitoring Report* estimated the cost of ensuring that every child and adolescent in low and lower middle income countries accessed good quality education from the pre-primary to upper secondary level. The total annual cost is projected to increase from US\$149 billion, based on 2012 estimates, to US\$340 billion over the next 15 years. Even after improvements in domestic revenue mobilization are taken into account this leaves an annual US\$39 billion financing gap (UNESCO, 2015b).

To identify measures to address this funding gap, the high level International Commission on the Financing of Global Education Opportunities was announced at the Oslo Summit in July 2015 (Oslo Summit on Education for Development, 2015). Co-convened by the prime minister of Norway; the presidents of Chile, Indonesia and Malawi;

and the Director-General of UNESCO, it is chaired by the UN Special Envoy for Global Education, with political leaders, policy-makers and researchers making up the members.

Its purpose is to make a strong case for investment in education and provide recommendations for deploying resources in more effective, accountable and coordinated ways, especially in determining budget allocations. It will look at a wide range of financing sources, including increased domestic resource mobilization through more strategic aid, non-traditional partnerships, innovative finance and the private sector.

The commission is expected to submit its report to the UN Secretary-General in September 2016. In view of its highly anticipated recommendations, which will also

draw on an expert panel on education financing, this section focuses on a more select set of domestic and international financing issues.

DOMESTIC RESOURCES

Mobilizing more domestic resources will be critical for fulfilling the SDGs. Domestic resources funded 71% of public expenditure on MDG-related sectors in 66 low and lower middle income countries in 2014 (Development Finance International and Oxfam, 2015). For education, the share was 86% (Action Aid, 2016).

The Education 2030 Framework for Action set two benchmarks on domestic financing for education: 4% to 6% of GDP and 15% to 20% of public expenditure. As the 2015 *EFA Global Monitoring Report* showed, poorer countries have made considerable efforts to prioritize education in their budgets but are more likely to miss spending targets because their overall budgets are small due to lack of domestic revenue (UNESCO, 2015a). The key question, then, is how to mobilize revenue.

Raising more domestic resources

In about half of all developing countries, tax ratios are below 15% of GDP, compared with 18% in emerging economies and 26% in advanced economies (Lagarde, 2016). Raising the ratio in poorer countries requires global and domestic efforts.

Addressing tax evasion and avoidance is a global responsibility. Many challenges in tax collection faced by poorer countries are global in nature. The pervasiveness of secret offshore companies that hide wealth and

“ In about half of all developing countries, tax ratios are below 15% of GDP ”

the use of taxes as a competitive advantage in global competition for investment are among the significant factors limiting countries' ability to raise domestic resources through taxation (Sachs and Schmidt-Traub, 2014). Tax incentives to attract

multinational companies have often disadvantaged developing countries. Corporate income tax exemptions have led to estimated losses of US\$139 billion a year in developing countries (Action Aid, 2013). Similarly, tax treaties often put poorer countries at a disadvantage; it is estimated that non-Organisation for Economic Co-operation and Development (OECD) countries lost US\$1.6

billion in 2010 as a result of US treaty provisions (IMF, 2014).

Recent estimates suggest that developing countries lose about US\$100 billion annually in revenue from multinational tax avoidance through offshore investments (UNCTAD, 2015). Illicit financial flows, defined as illegal movements of money or capital between countries, are symptoms of governance failures, weak institutions and corruption (OECD, 2015f). Lower income countries lost over US\$1 trillion in such flows in 2013 – over 10 times the amount of ODA received that year (Kar and Spanjers, 2015). Coordinated domestic and international action on tax incentives, treaties and harmful corporate decisions is needed for countries to get tax revenue they are owed (Action Aid, 2016).

Education can influence taxpayer behaviour and increase compliance. While important taxation-related challenges are global, the fact that in many poorer countries taxes account for less than 15% of the national income also reflects on an inability to broaden the tax base and collect income, property and other progressive taxes (IMF, 2013a).

Taxpayer behaviour is influenced by factors outside the tax system, such as how tax revenue is spent and the extent to which taxation mobilizes citizens' political engagement (Fjeldstad and Heggstad, 2012; OECD, 2015a). Those who avoid paying taxes are often highly educated elites within countries and within multinational corporations. But it is also true that educational attainment and tax knowledge are positively associated with tax-related attitudes. Data from the 2005 World Values Survey on 55 countries indicate that more educated individuals had more positive attitudes towards paying taxes (OECD, 2013b). Data from the same survey in India over 1990–2006 showed that university education was associated with decreasing tolerance for tax evasion and bribery (Shafiq, 2015).

Education also has an effect on tax-related behaviour. Income and sales taxes in 100 countries increased with educational attainment, which allowed the use of newer types of taxes that rely on widespread literacy (Kenny and Winer, 2006). An analysis of 123 countries over 1996–2010 associated very low literacy levels with reduced tax revenue (Mutascu and Danuletiu, 2013). Nevertheless, the effect has been found to be stronger in some regions, such as Latin America, than in others, such as Asia (Profeta and Scabrosetti, 2010).

Some countries have used taxpayer education programmes to improve compliance and instil a culture of paying taxes, thus increasing revenue and strengthening the compact between citizens and government, while others have incorporated tax education in their school curriculum. In Latin America, nine countries have included tax education in their curricula and developed materials jointly between education ministries and tax authorities. The government of Jamaica extended the Schools Tax Education Programme down to primary schools. Studies indicate that influencing tax culture requires education from an early age (OECD, 2015a).

Channelling more resources towards education spending

Collecting more revenue is an important starting point for ensuring that education receives adequate funding. But there is also scope in many countries to reallocate expenditure for the benefit of education.

Countries at similar levels of economic development have had very different trajectories in terms of prioritizing education. Among low income countries, Ethiopia almost doubled the share of its budget allocated to education, from 15% in 2000 to 27% in 2013, while Guinea, from the same starting point, slightly reduced its commitment to education. Among lower middle income countries in 2014, Kyrgyzstan and the Lao People's Democratic Republic reached the recommended minimum benchmark of 15%, while Pakistan only allocated 11.3% (Figure 3.2).

Two ways to prioritize spending for education are to remove fossil fuel subsidies and to earmark education funds.

Redirecting fossil fuel subsidies can boost education spending. A major source of potential revenue for education is the reform of fossil fuel subsidy regimes, which keep prices for certain energy goods lower than market prices (IMF, 2013b). Fossil fuel subsidies are well documented to be inefficient and inequitable because mostly richer families benefit while funds that could be used for pro-poor expenditure are limited (Anand et al., 2013; Arze del Granado et al., 2012; Clements et al., 2013).

The most recent International Monetary Fund (IMF) analysis suggests that global energy subsidies could reach \$US5.3 trillion in 2015, or 6.5% of global GDP (Coady et al., 2015). This estimate incorporates the high environmental and health costs of fuel consumption to calculate other subsidies implicit in existing fuel prices. Redirecting explicit and implicit fuel subsidies would be a useful way to fund the SDGs (Merrill and Chung, 2014),

including education (Steer and Smith, 2015). In Indonesia, public expenditure on education increased by over 60% between 2005 and 2009, largely due to fuel subsidy reform (Tobias et al., 2014).

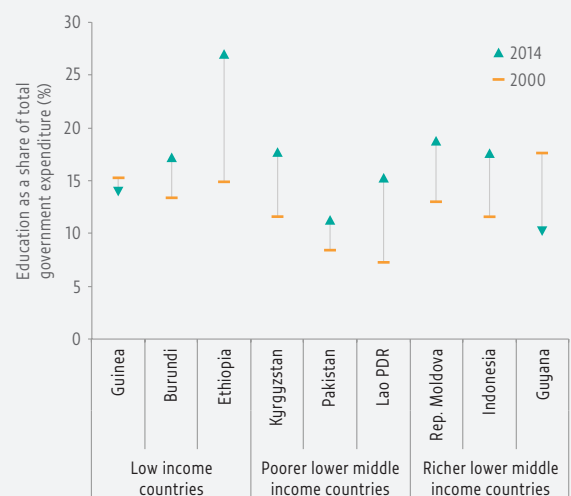
Governments have earmarked funds to increase education expenditure. Some governments have earmarked taxes for education expenditure. Knowledge that a tax will be used for social purposes can reduce resistance to paying it. Taxpayers may also like the accountability they believe earmarking provides regarding how their tax money is spent (Prichard, 2010). Earmarked taxes have been used to support primary and secondary education in Brazil and India, and tertiary education in Ghana and Nigeria (Action Aid, 2016).

Some fear that earmarking may dissuade other sources of funding and leave total revenue unchanged, lead to misallocation of resources within a sector and between sectors, and reduce flexibility in managing fiscal policy (Welham et al., 2015). However, such concerns are minor compared to the size of the need for financing to ensure education and lifelong learning opportunities for all.

FIGURE 3.2:

Increased allocation to education spending can happen at every level of economic development

Education as a share of total government expenditure, selected countries, 2000 and 2014 or most recent year



Source: UIS database.

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Even with substantial increases in domestic resources, there is still an annual finance gap of US\$21 billion that external aid must fill

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EXTERNAL RESOURCES

Even if low income countries intensify domestic resource mobilization, the annual financing gap is estimated at US\$21 billion, the equivalent of 42% of the projected total annual cost of achieving universal pre-primary, primary and secondary education by 2030 (UNESCO, 2015b). Aid will therefore continue to be a necessity for many low income countries. Among low income countries with data, three-quarters received direct aid to education that exceeded 10% of their total public expenditure on education (UNESCO, 2015a).

Total aid averages 0.31% of gross national income among member countries of the OECD Development Assistance Committee (DAC), having been more or less constant for 10 years. This is well below the 2005 pledge by 15 EU countries to allocate 0.7% to aid; in 2014, only Denmark, Luxembourg, Sweden and the United Kingdom did so. If DAC members and selected non-DAC donors reached the 0.7% pledge and committed to spend 10% of that on basic and secondary education, that alone would raise enough funds to close the entire US\$39 billion financing gap of low and lower middle income countries (OECD-DAC, 2016).

Instead, the volume of aid to education fell by about US\$600 million from 2013 to 2014 and by US\$1.2 billion relative to its peak in 2010 (see Chapter 20). In the context of a negative outlook for aid to education, this section discusses three options: the potential for earmarking more funds for education through multilateral mechanisms; the prospect of using more aid to build national authorities' capacity to raise domestic resources; and the gains that could be made by targeting aid to the countries and education levels most in need.

Multilateral mechanisms can help mobilize additional funds

Donors can provide aid through bilateral mechanisms, directly engaging with governments or non-government organizations (NGOs), or through multilateral mechanisms, channelling funds through international institutions. Multilateral channels appear less politicized,

more responsive to recipient countries, more likely to target countries based on poverty, less fragmented, more flexible and better for delivery of global public goods in areas such as health and climate change. On the other hand, there is no clear consensus as to whether multilateral channels are more efficient than bilateral channels (Gulrajani, 2016).

It has become more common for donors to earmark the funds they provide to multilateral agencies through trust funds specific to sectors or issues. A survey of DAC members attributed this trend to donors' desire for visibility and influence (Reinsberg et al., 2015). However, more multilateral earmarking can create challenges if earmarking increases fragmentation within multilateral organizations (Gulrajani, 2016; Killen and Rogerson, 2010).

Still, earmarking has been used extensively to increase funding to the health sector. Between 2006 and 2014, aid disbursed to health by multilateral organizations increased by US\$2.6 billion due to issue-specific funds such as the GAVI, the Vaccine Alliance. In education the corresponding increase was only US\$952 million. It is vital for the education sector to improve its use of such mechanisms to raise additional funds (OECD-DAC, 2016).

Aid can play a catalytic role in increasing domestic resources

Given limited political will to expand aid resources, how can existing aid be better used to support domestic resource mobilization? In 2013, only US\$96 million, less than 0.07% of total development assistance, was allocated to projects supporting domestic revenue mobilization in low income countries. Afghanistan, Mozambique and the United Republic of Tanzania collectively received one-third of the total.

In Mozambique, a revenue authority was created in 2006. A pool of donors provides direct support in a partnership arrangement with the authority. As a result,

tax collection doubled between 2008 and 2013, and the contribution of more progressive direct taxes tripled (Strawson and Ifan, 2016).

The role of aid in catalysing domestic resources was endorsed as a key aspect of international cooperation under the Addis Tax Initiative at the Third International Conference on Financing for Development in July 2015. Donors committed to double technical cooperation for domestic resource mobilization by 2020 (Strawson and Ifan, 2016). In recent years, more funds are being channelled to international initiatives such as the IMF Tax Policy and Administration Topical Trust Fund (Strawson and Ifan, 2016).

In the case of health, the United States has announced that US\$63.5 million previously allocated to the President's Emergency Plan for AIDS Relief (PEPFAR) would be retargeted to domestic resource mobilization initiatives in Kenya, Nigeria, the United Republic of Tanzania, Viet Nam and Zambia, with the express intention of raising US\$1 billion for public health-related activities (Runde et al., 2014).

Aid to education is not effectively targeted where it is most needed

One of the main aims of development assistance is to benefit those in need. Mapping the mandates of 50 aid agencies indicates that 6 include a legal act requiring them to make poverty reduction a goal of development cooperation, 21 view poverty reduction as a primary goal, 10 view it as a joint goal and 13 have no specific goal for poverty reduction. Among agencies with a legal mandate to end poverty, over 80% of their development assistance is allocated to countries with a higher than average poverty rate. Agencies with no explicit poverty reduction goal allocate only 31% of their development assistance to such countries (Strawson et al., 2015).

Economic and political interests are key aspects of donors' funding decisions (Alesina and Dollar, 2000; Claessens et al., 2009). An analysis of 170 recipient countries found that aid allocation to basic education since 2003 reflected donor trade-related interests more than receiving country needs as measured by enrolment or completion rates (Sumida, 2016).

The percentage of children completing primary school is a potential measure of country need. The average child in Mongolia received US\$45 in aid to basic education in 2014 even though the primary completion rate was 97% in 2010 (UNESCO, 2016a). By contrast, Chad, where the primary completion rate was 28% in 2010, received US\$3 per primary school age child in 2014 (**Figure 3.3**). In Liberia and Mauritania, about half the children complete primary school, but Liberia receives 10 times the amount of aid to basic education per school-age child.

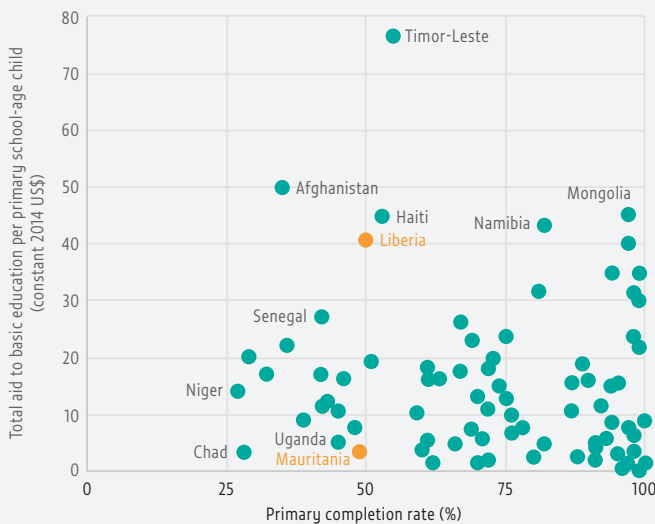
While per capita allocations of aid to basic education to Afghanistan and Liberia have generally increased in recent years, they have remained essentially flat in Chad and have been decreasing in Mauritania (**Figure 3.4**). Donors need to address such disparities if they are to help to achieve ambitious targets and ensure equity.

Aid to education should also be spent where it has the highest potential to improve equity. Public spending for higher education benefits the wealthy most (Lustig, 2015) while early investment in education has strong benefits for disadvantaged children (UNESCO, 2015a). Yet, early childhood care and education received only US\$106 million in 2014, less than 3% of disbursements for post-secondary

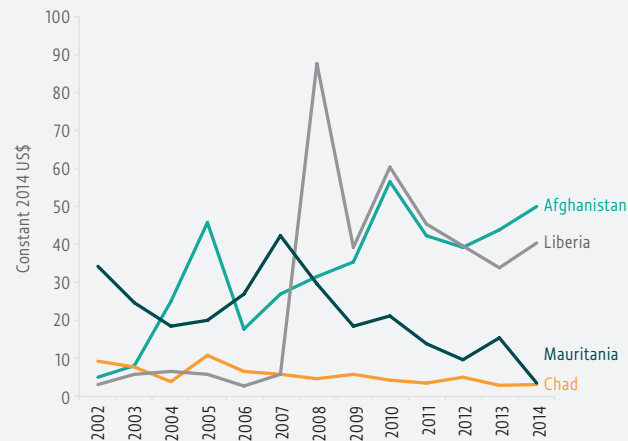
FIGURE 3.3:

Aid to basic education is not related to need

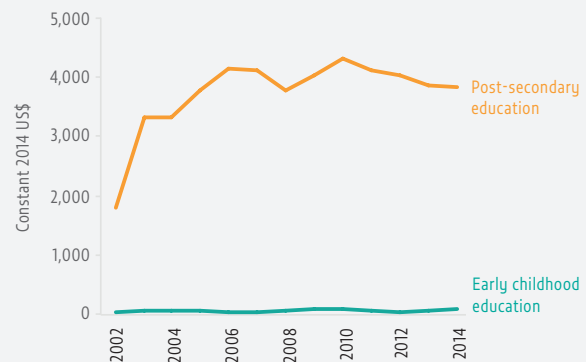
Total aid to basic education per primary school-age child (2014) and primary completion rate (2008–2014)



Sources: GEM Report team analysis based on OECD Creditor Reporting System data (OECD-DAC, 2016); World Inequality Database on Education.

FIGURE 3.4:**Inequities in aid to basic education persist***Total aid to basic education per primary school-age child, selected countries, 2002–2014*

Source: OECD-DAC (2016).

FIGURE 3.5:**Donors prioritize levels of education that are less accessible to the poor***Direct aid to (a) early childhood care and education and (b) post-secondary education, 2002–2014*

Source: OECD-DAC (2016).

education (Figure 3.5). Most aid to post-secondary education, moreover, largely supports students coming to study in the donor countries. Thus, a substantial portion of it does not even reach developing countries (UNESCO, 2015a).

POLICY COHERENCE

In the SDG era, sector-specific approaches are insufficient to meet the cross-cutting, interdependent challenges of sustainable development (Le Blanc, 2015). Instead, the context is more favourable to concepts such as ‘collective impact’ (Kania and Kramer, 2011), which suggests intentional, structural coordination of efforts to meet broader outcomes; ‘systems thinking’ (Chapman, 2004), or viewing the integrated whole as greater than the sum of its parts; and ‘whole-of-government’ approaches (United Nations, 2014), which require ministries to work together.

From a policy perspective, multisector approaches can prevent competition for scarce resources and help use existing resources more efficiently. Integrated service provision can be a means of reaching the most vulnerable, addressing their multiple needs simultaneously and reducing the cost of service duplication (OECD, 2015d).

Since diverse perspectives are needed for improved integration and problem solving (Hong and Page, 2004), education planning may also benefit from a range of expertise beyond education ministries (Jacobs, 1964). For instance, an education ministry that aims to mitigate

gender disparity in school enrolment and attainment would need to be aware of the non-education structural barriers to girls’ and boys’ schooling, which require a greater understanding of social development and the labour sector. SDG-related development efforts require such horizontally integrated action (Le Blanc, 2015). There is also a strong need for vertical integration, i.e. coordination and collaboration between levels of government, with clarity in their roles and responsibilities (OECD, 2013a). Figure 6.1 illustrates these horizontal and vertical relationships.

The broad SDG agenda with its multisector demands requires good local planning linked with coherent, nationally relevant vision and support (Antonio et al., 2014; Urama et al., 2014). This section looks at examples of national efforts to improve coherence, effective multisector planning, and challenges in integrated planning.

POLICY COHERENCE IN GOVERNMENTS

Integrated planning has gained prominence in post-2015 development discussions. However, multisector planning initiatives, especially those that focus on integrated basic service delivery for the poor, are not new. Integrated approaches to development have been carried out since the 1970s and 1980s, such as strategies that couple loans for rural economic development with those to address basic needs in health, sanitation and education, to jointly address rural poverty (Belgian Survival Fund and IFAD, 2009; Bovill, 2009).

A meta-analysis of literature on interventions that combined health with other sectors (education, economic development, nutrition, environment) found that 13 of the 25 interventions assessed produced mostly positive findings, 9 produced mostly mixed findings and 3 had a neutral or unknown effect. School feeding and

deworming programmes, obesity interventions in schools and integrated early childhood development initiatives were some of the multisector education-relevant interventions found to yield mostly positive outcomes (FHI 360, 2015).

BOX 3.1

School feeding and school health as integrated delivery mechanisms

School feeding programmes are among the most widespread social protection programmes. Providing food in schools can improve some of the education, health and nutrition outcomes of school-age children while supporting the agricultural sector and benefiting the community. As a result, these programmes are often jointly coordinated by ministries of health, agriculture and education. It is estimated that every dollar spent on school feeding brings three dollars in economic returns.

International cross-institutional collaboration includes the Nourishing Bodies, Nourishing Minds initiative, established in 2013 by the World Food Programme, UNICEF and UNESCO to work with governments and the private sector in Haiti, Mozambique, Niger and Pakistan, taking advantage of the synergy inherent in nutrition and education. Additionally, funding from the Bill and Melinda Gates Foundation for local agriculture has focused on connections between smallholder farm production and school feeding.

School provision of health services such as deworming and sexual and reproductive health education is also efficient. FRESH (Focusing Resources on Effective School Health), an initiative of UNESCO, UNICEF, the World Health Organization and the World Bank, argues that multiple strategies, including health-related school policies, safe water and sanitation, skills-based health education and school-based health and nutrition services, should be used in schools.

School feeding and health interventions appear to be cost-effective compared to other means of delivery, though evidence is limited. In low income countries, there are typically more teachers than nurses and more schools than clinics. Employing teachers to deliver simple interventions, such as pills or micronutrient supplements, may cost one-tenth as much as delivery through traditional mobile health teams, although additional teacher training costs need to be considered.

Sources: Guyatt (2003); Krishnaratne et al. (2013); UNESCO (2002); UNESCO (2015a); UNESCO et al. (2013); World Food Programme (2009); World Food Programme (2013).

A research study of an integrated programme to improve self-employment among the very poor entailed 6 randomized control trials in Ethiopia, Ghana, Honduras, India, Pakistan and Peru, and assessed progress on 10 welfare outcomes or indices (consumption, food security, productive and household assets, financial inclusion, time use, income and revenue, physical health, mental health, political involvement and women's empowerment). The integrated interventions included skills training on running a business and choosing livelihoods, and health, nutrition and hygiene training. The evaluation found a significant impact on all 10 outcomes, with gains sustained in 8 of the 10, a year after programme completion. The evaluation also conducted a cost-benefit analysis, and estimated that benefits were higher than costs in all countries except Honduras (Banerjee et al., 2015).

Multisector interventions can also provide arguments for investment in interventions that do not appear cost-effective if evaluated from the perspective of only one sector. In Senegal, it was estimated that addressing literacy, health and nutrition challenges simultaneously would be more likely to break the intergenerational cycle of poverty (Nordtveit, 2008). While a cost-effectiveness analysis of a cash transfer programme in Zomba, Malawi, found that the cost per prevented HIV infection was prohibitive at US\$5,000 to US\$12,500 (Baird et al., 2012), a co-financing, cross-sector approach could help secure funding because of the multiple benefits of such programmes (Remme et al., 2012). School feeding and school health interventions are important examples indicating that addressing child health and nutrition through the school system is cost-effective (**Box 3.1**).

There are good examples of integrated planning ...

While there is a robust rationale for integrated planning and some credible evidence in its favour, successful implementation requires political commitment, an appropriate institutional environment, financial and technical know-how, and an appreciation of power dynamics (Persaud, 2016). This section discusses three instructive examples of national efforts to improve multisector planning. They reflect the importance of

political will, institutional support, adequate capacity and available data to support the integration process.

Nigeria: large-scale, local implementation to meet the MDGs. Nigeria used US\$18 billion from debt relief in the 2005 Heavily Indebted Poor Countries initiative to launch its Office of the Senior Special Assistant to the President on the Millennium Development Goals. Between 2007 and

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Nigeria established
a grants scheme
integrating responses
for health, education,
and water and sanitation
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the Conditional Grants Scheme to Local Government Areas (CGS-LGA) Track to more effectively reach local governments, strengthen primary health and education systems, and help them provide priority services through a strong emphasis on local, data-driven planning (Iyengar et al., 2015).

The CGS-LGA Track had significant political support, including a high powered steering committee and a special MDG adviser from an associated presidential office. Since the funds were provided under a debt relief initiative, the Ministry of Finance was able to tag funds for pro-poor investment (Persaud, 2016).

The design and implementation of the CGS-LGA Track demonstrated strong horizontal and vertical integration, prioritizing health, education, and water and sanitation. Local project priorities were discussed in joint meetings of the planning unit and the other sectors. A joint federal, state and local financing arrangement motivated commitment at all levels (Persaud, 2016). Local officials had to develop proposals that identified priority local needs using the Nigeria MDG system of indicators and inputs, which was developed for this project (Iyengar et al., 2014; Iyengar et al., 2015). This use of data-driven decision-making eventually led to the first common database on health and education facilities, which eventually became available to all government programmes, development partners and civil society groups.

The focus was on filling financial gaps where sector-specific funding was inadequate and avoiding duplication

of line ministries' projects. In some cases, such as drilling boreholes at schools or in communities, water and education officials had to agree on detailed joint plans (Persaud, 2016).

According to a report, by 2014, the project had disbursed more than US\$300 million towards strengthening MDG-focused health and education interventions in one-third of the country, and efforts were being made to scale up nationwide. Over 90% of the funds were used for infrastructure projects in the three sectors. An independent assessment of progress from the first round of grants found that over 80% of the more than 5,000 projects could be sustained through community efforts (Earth Institute, 2015).

Colombia: a pioneer of SDG implementation. Colombia's government has been instrumental in developing the post-2015 agenda and proposing an integrated approach to development (Development Finance International, 2016; OECD, 2015f). It is also active in global efforts to understand how to incorporate the SDG agenda into national development plans.

In February 2015, even before the SDGs were agreed, the government established an inter-agency commission on preparation and implementation of the post-2015 development agenda and SDGs (Lucci et al., 2015). It is composed of ministers and vice-ministers, signalling strong political commitment to cross-sector implementation (Persaud, 2016).

There is clear vertical integration of the national development plan. Once consensus was reached at the national level, the government encouraged governors and mayors to include the SDGs in their development plans, which define the main local development priorities for 2014–2018 (Development Finance International, 2016).

The three core pillars are education, peace and equity, and are considered to be presidential priorities. The new agenda also aims at a lifelong learning perspective that defines targets for all education levels and ages. The national development plan aims to make Colombia the most educated country in Latin America by 2025 (Development Finance International, 2016).

Colombia was one of the first countries in Latin America to decentralize its education system to tackle inequitable spending across regions. The Ministry of Education formulates policy and objectives, and monitors the

system, while municipalities manage and plan the use of physical, human and financial resources and are responsible for education outcomes. The ministry introduced a project in 2004 to provide technical assistance to local governments based on their needs, recognizing that effective service provision depends on local financial and human capacity (Development Finance International, 2016).

While the national education plan is developed at the national level, there are also regional development plans and municipal education plans. Multilevel planning is accompanied by a decentralized budget system, with a mechanism to redistribute national funds to the main social sectors: education receives 58.5%. There is also an equity-based formula to distribute funding across territorial entities (Development Finance International, 2016).

Malaysia: integrating the technical and vocational education strategy. Technical and vocational education can be key for workforce development. The sectors typically involved are education, labour, youth and economic development. In Malaysia, there is political support to improve

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Malaysia works across education, labour, youth and economic development in order to help with workforce development

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workforce development in the interest of national economic development. The Tenth Malaysia Plan 2011–2015 and accompanying Education Blueprint 2013–2025 project are being used to overhaul educational and training systems. A primary objective is to raise

the workforce’s skills and employability so Malaysia can compete with more advanced economies in the region and become a high income nation by 2020 (Malaysia Economic Planning Unit, 2009; Sander et al., 2013).

A key emphasis has been on ensuring that technical and vocational education, delivered by multiple ministries, is better harmonized and in line with industry requirements. The establishment of a national qualifications framework helped significantly broaden, unify and streamline the qualifications system. Between 2000 and 2010, the number of occupations covered by the national occupational skills standards increased from 500 to 1,585 (World Bank, 2013).

The development of competency standards is participatory and includes representation from women’s organizations and private industry. A common set

of standards and testing has effectively unified the substance of training, despite the fact that it is spread across ministries. Since 2000, several government-sponsored incentive programmes have aimed to foster links between education institutions and industry to improve employability and enhance workforce qualifications with on-the-job training (World Bank, 2013).

... but planning and financing processes remain fragmented

Despite such positive examples, governments typically define mandates, priorities, budgets, administrative and planning processes, and monitoring and evaluation in ways that are at odds with integration (Persaud, 2016). Government agencies tend to focus on policy formulation and implementation in their respective sectors, hampering coordination and collaboration, within the context of a myriad of bureaucratic and political structures that influence decision-making.

An analysis of 76 low and middle income countries for the GEM Report indicates that well-developed national plans that are linked to good education financing plans and decentralized planning and financing systems, and that lead to good cross-sector integration, are the exception rather than the rule in most poorer countries (Development Finance International, 2016).

National plans need to coordinate sectors horizontally. Yet, out of 27 countries with survey-based information on coordination mechanisms for early childhood development, for instance, while 17 had a national-level, explicitly stated multisector strategy, only 8 had established processes to coordinate budget-setting across ministries (World Bank, 2016).

Similarly, the lack of a unified, coordinated approach has been identified as a major challenge in technical and vocational education policy (Marope et al., 2015). In Ghana, institutional training, employment opportunities and industry needs are reportedly mismatched. Parliament established a council for technical and vocational education in 2006 to reform the sector, with representation from nine ministries and state partners. However, the council was placed under Ministry of Education control, which led to rivalries and hindered collaboration (Ansah and Ernest, 2013).

National plans need to be well coordinated vertically with local implementation strategies. Where local planning is done well, sector silos can be broken down. Success in vertical integration is often contingent on subnational governments having the capacity to plan, budget, coordinate, implement and oversee processes between sectors – and the authority to do so. At the same time,

good central planning that provides the flexibility for local adaptation is also important (OECD, 2013a).

Ethiopia has a sophisticated set of horizontal and vertical planning strategies. A robust federal and regional process is in place for planning, coordination and integrated budgeting in education. Regional education ministries are responsible for some oversight and spending but most decisions are taken at the local (*woreda*) level. Local plans take a multisector approach, e.g. health clinics

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In Ethiopia, local education plans take a multisector approach

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and centres being planned alongside schools. However, there have been some challenges. Local education offices reportedly feel more accountable to local councils, which provided their budget, than to regional education bureaus. This hampered regional-level monitoring

(Development Finance International, 2016).

In South Africa, the 1996 Constitution pertained to the national and provincial levels of government. Financing decentralization was the key measure used to address historical spatial inequality. Education had high political priority. In provincial budgets, education received the largest portion of the funding reserved to enhance equity. There were also grant programmes available for education infrastructure and other projects.

However, the system hindered cross-sector planning. More than 20 agencies and structures provided education, contributing to very slow delivery and even litigation against the government. When provinces could not deliver school infrastructure, some of the management was reinstated at the national level. A review of a national integrated plan for early childhood development between 2005 and 2010 showed that it was extremely difficult to coordinate and integrate the services offered by the several departments involved (Development Finance International, 2016).

Nevertheless, some improvement has been seen. With the adoption in 2012 of the National Development Plan 2030, which sets forth outcomes and roles for various sectors, and a dedicated monitoring and evaluation department, South Africa has created a chain of education accountability with lines of responsibility from state to classroom (South Africa National Planning Commission, 2012).

POLICY COHERENCE IN AID AGENCIES

Agencies that provide overseas development assistance, like all government agencies, face two challenges in delivering programmes that are consistent with the integrated planning needs of the SDGs: they may lack a coherent vision of their approach to development, and they face difficulties in coordinating programmes that span different sectors.

Achieving policy coherence for development

The concept of policy coherence for development aid emerged in the 1990s with growing concern over aid effectiveness. At that time, donors committed to increase coherence between aid and other policies affecting lower income countries (OECD, 2015c). For instance, Policy Coherence for Development was a tool intended to ensure that EU policies supported lower income countries' needs and the MDGs, and at the very least did not contradict aims of poverty eradication. All EU countries are legally obliged to follow this approach (Latek, 2015; Trocaire, 2013).

Many donors recognize the importance of addressing development challenges more holistically. For instance, EU allocation of at least 20% of the development budget to social protection, health, education and jobs suggests recognition of the need for integrated planning across SDG sectors, including education (Mercer, 2014). The most effective education-aided activities are those that target issues beyond schools, such as community participation and costs for families, and engage with actors beyond education ministries (Samoff et al., 2016).

Germany has long advocated policy coherence in development. Its Coalition Treaty committed to improve coordination to make policy more development oriented. This support of policy coherence for development has translated into a holistic approach to the SDG agenda (OECD, 2015e). Its education aid strategy emphasizes that it addresses every level of education from early childhood to tertiary education; the transition phases between levels; and formal, non-formal and informal education with a view to encourage lifelong learning (Mercer, 2014).

The United States, which issued a Global Directive on Development Policy in 2010, has historically lacked a coherent set of policies. Efforts to promote a whole-of-government approach have also largely failed in recent years, since the administration promoted development to the level of diplomacy and defence but did not give the US Agency for International Development the tools necessary to act at this level (Gavas et al., 2015).

Implementing multisector aid programmes

Even if an agency has a coherent vision of development, implementing multisector programmes is a major task.

UNICEF's social protection strategy takes a multipronged, systematic and coordinated approach to reduce social and economic vulnerability faced by children and their families. It tries to address multiple factors and maximize effectiveness and impact across sectors (UNICEF, 2012). In Ghana, UNICEF has supported a cross-sector integrated approach through the Livelihood Empowerment Against Poverty programme. While overall coordination is the responsibility of the Department of Social Welfare, participation by other line ministries, such as Education, Health and Labour, is facilitated by an interministerial committee (UNICEF, 2012). Similarly, with regard to education outcomes, UNICEF highlights the value and impact of other sectors' actions on education, including water and sanitation, public works, health, child protection, social development, welfare and protection, and employment (UNICEF, 2012).

Other examples of multisector aid programmes, such as the Millennium Development Goals Achievement Fund and its successor, the Sustainable Development Goals Fund, suggest growing acceptance of the integrated planning discourse within the United Nations (**Box 3.2**).

The World Bank has adopted sector-wide approaches across multiple sectors to facilitate an integrated approach to development (Independent Evaluation Group, 2010). In 2005, its Ceará Multi-Sector Social Inclusion Development Project in Brazil integrated education, health, water and sanitation, water source management, and environment. It promoted multisector policy coordination and applied a result-based management approach: failure to meet performance indicators affected the release of resources from the Treasury. For instance, when a target on hospital admissions was missed, a multisector study was required to determine the reason; it led to a strong demonstration of the need for intersector coordination, since failure to meet the target resulted from issues beyond the health sector (Batley et al., 2007; Persaud, 2016).

Experience from other World Bank programmes, however, indicates that despite the logic of multisector projects, it is often difficult to execute them. In an evaluation of World Bank health, nutrition and population sector activities, three-quarters of the country assistance strategies acknowledged the importance of other sectors for health, nutrition and population outcomes.

BOX 3.2

The MDG Achievement Fund and the SDG Fund

The Millennium Development Goals Achievement Fund was the first significant UN initiative to support inter-agency work and integrated, multidimensional joint programmes on the MDGs. The fund also aimed to promote system-wide coherence across UN agencies. Established in 2006 through an over US\$840 million deal between Spain and the UN system, it has financed 130 joint programmes in 50 countries on 8 thematic areas, such as youth employment and migration. Country-specific evaluations have found that the multisector approach helped avoid or reduce overlap between development programmes, and increased coordination and collaboration within and between governments and development partners.

Its successor, the Sustainable Development Goals Fund (SDG Fund), was created in 2014 and has programmes in 21 countries on 3 thematic areas – inclusive growth for poverty eradication, food security and nutrition, and water and sanitation – and 3 cross-cutting issues: sustainability, gender equality and public-private partnerships. At least three UN agencies, on average, are engaged in each joint programme. The thematic areas were those identified as key areas requiring integrated action to improve outcomes. The SDG Fund has established an advisory group to engage more proactively with the private sector.

Sources: Capra International Inc. (2014); ILO (2013); UNDP (2013); Sustainable Development Goals Fund (2016).

Education was the second most cited sector, after water and sanitation, in regard to its impact on health, nutrition and population. Two multisector lending strategies were implemented to improve health outcomes: one on projects in complementary sectors to health and the other on multisector projects linking actions in many sectors through a single loan (Independent Evaluation Group, 2009).

An evaluation of the two strategies concluded that multisector projects, which mostly took place in low income countries and focused on HIV and AIDS, were demanding to implement due to the number of agencies involved. Countries often had limited capacity to deal with this complexity. As a result, while about two-thirds of single-sector projects were deemed to have performed satisfactorily, less than half the multisector projects had satisfactory outcomes (Independent Evaluation Group, 2009).

PARTNERSHIPS

Local and national government authorities, civil society, academics, the scientific community, the private sector and global multistakeholder partnerships are some of the important partners that have helped implement global agendas such as the MDGs (United Nations, 2015b). A recent analysis highlights 10 factors in making development partnerships effective. They include securing high level leadership, ensuring context-specific and country-led partnerships, clarifying roles and responsibilities, and focusing on financing, results and accountability (OECD, 2015b).

The ambition of the SDGs points to potential roles for civil society, the private sector and multistakeholder

“ The ambition of the SDGs calls for partnerships between civil society, the private sector and multistakeholder partnerships, such as GPE

partnerships in financing, implementing and ensuring mutual accountability of a new agenda that is expected to be driven by national governments (Hazlewood, 2015; UNIDO and UN Global Compact, 2014; World Economic

Forum, 2014). This section examines some of the global discussions of the roles of civil society, the private sector and multistakeholder partnerships in the SDG agenda.

CIVIL SOCIETY IS A KEY PARTNER WITH DIVERSE INTERESTS

In 1996, the UN Economic and Social Council established consultative status for NGOs and civil society organizations (CSOs). The 2030 Agenda for Sustainable Development has provided a new platform for them to participate in the global follow-up and review process for the SDGs (United Nations, 2015b).

In the education sector, increased civil society activity was a key achievement of the EFA agenda and Dakar Framework after 2000 (UNESCO, 2015a). CSOs became more active in tracking budgets to increase transparency, advocating for more funding for marginalized groups, and raising awareness and empowering communities to reform corrupt practices.

National civil society activity has been supported by global efforts, such as the Global Campaign for Education and the Civil Society Education Fund, which have helped build networks and national capacity to improve advocacy and monitor progress (UNESCO, 2015a). Some large international NGOs are significant funders of education in lower income countries, and their financing and programming support better prioritizes basic education and humanitarian aid to education than do donor countries (Naylor and Ndarhutse, 2015).

But there are challenges in designing civil society partnerships more productively in relation to the SDG agenda. How can organizations heavily dependent on donor funding maintain an independent voice (UNESCO, 2015a)? Another challenge is the enormous variety of disparate actors with differing priorities and influence under the civil society umbrella (Moksnes and Melin, 2012). Whose voices are being captured at the global and national levels? These questions need careful consideration.

THE ROLE OF THE PRIVATE SECTOR IS VIEWED WITH AMBIVALENCE

While the MDGs made only limited reference to the private sector, the 2030 Agenda more explicitly recognizes its importance, particularly regarding involvement in mobilizing the funds required to meet the SDGs. The dynamism and funding the private sector can bring to the SDGs is reason for optimism (UNIDO and UN Global Compact, 2014). But there are also strong concerns about the role of corporate practices in fostering unsustainable behaviour (Pingeot, 2014).

Within the education sector, views are divided on public-private arrangements to finance and manage education delivery, which are becoming more common in much of the world (Ginsburg, 2012). In richer countries, governments have entered into elaborate funding and monitoring arrangements with private actors. But in poorer countries, the private sector is loosely regulated. While some hail the growth of private involvement as bringing financing, flexibility, innovation and improved learning outcomes (Patrinos et al., 2009), sceptics, who view the private sector's growing role as a result of the public sector retreating from its responsibility to provide education, see a potential for undue market influences in schooling and widening inequality (Robertson and Verger, 2012).

Perhaps as a result of this debate, the Education 2030 Framework for Action, while calling for private involvement in mobilizing additional resources and aiding school-to-work transition, also stresses respecting education as a human right and ensuring that private efforts do not increase inequality (UNESCO, 2016b).

GLOBAL MULTISTAKEHOLDER PARTNERSHIPS IN EDUCATION

If global aspirations for SDG 4 are to be fulfilled, the role of coordination and financing bodies is critical. The formation of a steering committee, led by UNESCO, is expected to bring coherence in Education 2030 activities. The Global Partnership for Education (GPE) is the main multistakeholder financing partnership in education, and better leveraging it will be key to meeting financing requirements. A new fund for education in crises is being added to the global architecture to improve links between development and humanitarian aid.

Education 2030 coordination structures

The Education 2030 Framework for Action specifies that the global coordination mechanism includes the SDG-Education 2030 Steering Committee, Global Education Meetings, regional meetings and the Collective Consultation of NGOs on Education for All. Preparation for the mechanism is informed by the results of the internal evaluation of UNESCO's role in global EFA coordination, which recognized that its task was made more difficult by the varying level of engagement of the other four convening partners. The evaluation also called for UNESCO to strengthen coordination through a strategic approach that is results-oriented and closely monitored (UNESCO, 2016c).

The SDG-Education 2030 Steering Committee, which met for the first time in May 2016, is expected to be the main mechanism to support countries, review progress (drawing on the GEM Report) and encourage harmonization and coordination of partner activities. The committee is made up of representatives of member states from six regions, the E9 forum (nine countries committed to achieving EFA), the three key convening agencies (UNESCO, UNICEF and the World Bank), and representation from another agency (rotating between United Nations Development Programme, United Nations High Commissioner for Refugees, United Nations Fund for Population Activities, UN Women and the International Labour Office), the GPE and the OECD,

as well as from NGOs, teacher organizations and regional organizations (UNESCO, 2016b).

The steering committee is to act as the voice of the international education community in SDG agenda implementation. An important consideration, therefore, is what it will say in global SDG 'follow-up and review' structures, especially the High-Level Political Forum for Sustainable Development and its thematic reviews (see Chapter 9).

Global Partnership for Education

Global financing partnerships target particular sectors, as in the case of GAVI and the Global Fund for Tuberculosis, AIDS and Malaria, or have cross-sector mandates, such as those of the Urban Poor Fund International and the Global Alliance for Improved Nutrition. They can serve a variety of purposes, from improving collaboration among stakeholders in a given sector to catalysing new investment, raising national and local funds, and fostering public-private collaboration. Pooled mechanisms such as these can reduce fragmentation as well as transaction costs for donors and receiving countries. Since the SDG agenda is more integrated and universal than that of the MDGs, more significant cross-sector collaboration and learning are needed to achieve system-wide impact (Hazlewood, 2015).

The GPE, established in 2002 as the EFA Fast Track Initiative, is the education sector's principal multistakeholder partnership. Its broad mission, according to its 2016–2020 Strategic Plan, is 'to mobilize global and national efforts to contribute to the achievement of equitable, quality education and learning for all, through inclusive partnership, a focus on effective and efficient education systems and increased financing' (GPE, 2016).

Since its first external evaluation in 2010, the GPE has made many strategic and operational changes, such as better targeting fragile contexts, helping build national capacity for education planning and revamping its board of directors. Its second evaluation stressed that the GPE needed to improve its approach for evaluating success, as it had not introduced a theory of change or a result framework, features that have been added in its new strategic plan. The evaluation also noted the GPE's limited ability to raise additional education financing, despite an increasingly ambitious mission. About US\$2.1 billion in aid was pledged to the GPE Fund in the 2015–2018 replenishment round, the equivalent of US\$525

million disbursed per year (Results for Development and Universalis, 2015).

By contrast, the health sector's multistakeholder partnerships are believed to have leveraged substantial funds; mobilized civil society and business partners; improved the allocation, predictability and transparency of funds; and facilitated knowledge transfers (Sachs and Schmidt-Traub, 2014). While health and education are fundamentally different sectors in terms of their objectives and functioning (Chabbott, 2014; de Moura Castro and Musgrove, 2007), learning from health partnerships could be especially important for education.

Education Cannot Wait fund for education in crises

Education Cannot Wait, a new fund for education in crises, was launched at the World Humanitarian Summit in May 2016. It aims, by 2020, to raise up to US\$3.85 billion and reach 18% of children and youth whose education is affected by conflict, natural disasters and disease outbreaks. It will work to address the challenges of the field and raise the profile of education in crises (see Chapter 20) (ODI, 2016).

Its main component, the Breakthrough Fund, will serve three functions. First, it will channel immediate support in a crisis through existing agencies. Grants will be given to consolidated appeals, which already meet a certain benchmark of funding. This rapid response mechanism could finance temporary access, essential supplies or back-to-school campaigns.

Second, it will facilitate engagement at the country level for up to five years, based on a country plan to be devised within three months of the onset of a crisis to bridge and consolidate existing plans. The plan is to be informed by a joint comprehensive need assessment and integrated into existing national planning processes and aid flows, such as those provided by the GPE.

“ The Education Cannot Wait fund aims, by 2020, to reach 18% of children and youth whose education is affected by conflict, natural disasters and disease outbreaks ”

Third, it will aim to attract non-traditional donors, philanthropists and the private sector, which may not be able to provide contributions directly to a general purpose fund.

In addition, to improve education response capacities, the fund's Acceleration Facility will invest in existing initiatives such as the Education Cluster, the UN Refugee Agency and the Inter-Agency Network for Education in Emergencies.

CONCLUSION

There is growing recognition that stakeholders need to plan together, act together and commit to equity and sustainability. Some countries have made significant strides in increasing financing and engaging in more integrated planning across sectors and levels of government. Calls for multistakeholder partnerships firmly recognize the importance of non-state actors.

However, the status of financing, planning and implementation arrangements shows that the current environment is very far from what is needed to achieve the aspirational goals of the 2030 Agenda for Sustainable Development. From the perspective of the education sector, the vast majority of government action still takes place in sector or subsector silos constrained by a narrowly focused administrative structure. It is difficult to identify instances in which planning and financing is well coordinated across levels of government. Education funding from the private sector and multilateral institutions is limited. Moreover, from the broader perspective of all sectors involved in the SDG agenda, integration is also lacking. And incentives and administrative tools to link activities across sectors are underdeveloped.

This state of affairs provides a useful reference point for assessing future progress as well as anticipating challenges in achieving the global education goal. There is a clear need to keep correcting inefficiency in financing and advocating for more funds for education. Political commitment and administrative capacity are key to ensure successful multisector, multilevel government arrangements. Finally, it is necessary to keep pressuring donors to fulfil their most relevant role for education funding: ensuring that the holistic agenda of SDG 4 and the other SDGs is achieved.



Here students in Indonesia learn about the animals and plants near the beach. The activity is designed to encourage the students to be more environment friendly.

CREDIT: Nur'aini Yuwanita Wakan/UNESCO

The background of the page features a photograph of several young students in a classroom. They are wearing white short-sleeved shirts and red skirts. One student in the foreground is looking down at a book or paper. Another student to the left is also looking down. The classroom has a wooden floor and a blue wall in the background.

CHAPTER

4

Education and sustainable development: conclusions and policy recommendations

KEY MESSAGES

For education to be transformative in support of the new sustainable development agenda, 'education as usual' will not suffice.

Collaborate across sectors: Include ministries, civil society, the private sector, at the local and national level.

Use education as a capacity-building tool in all sectors. Invest in integrated interventions that will have multiplier effects for several development outcomes.

Education cannot fight inequality on its own. Labour markets and governments must not excessively penalize lower income individuals. Cross sectoral cooperation can reduce barriers to gender equality.

Education funding needs to be both adequate and predictable to ensure the provision of good quality education, especially to marginalized groups.

PROSPERITY: Invest in teaching green and transferable skills in school and the workplace. Incentivize universities and agricultural extension to focus on green economic growth and sustainable agricultural production. Promote cooperation across all sectors to encourage full economic participation by women or minority groups.

PARTNERSHIPS: Develop equitable funding mechanisms. Use progressive public finance policies to fund lower levels of education; combine grants and loans to finance upper levels of education. Increase multilateral aid mechanisms and engagement with the private sector. Mobilize domestic resources by improving knowledge about tax systems, halting tax evasion, and eliminating fossil fuel subsidies.

PLANET: A whole-school approach is needed to build green skills and awareness. Campaigns, companies, as well as community and religious leaders must advocate for sustainability practices. Non-formal education and research and development should also help solve global environmental challenges.

PEOPLE: Ensure universal access to basic services. , Support the integration of marginalized groups by investing in early childhood care and education, social protection programmes and awareness campaigns. Fund integrated delivery of basic services in schools.

PEACE: Expand education on global citizenship, peace, inclusion and resilience to conflict. Emphasize participatory teaching and learning especially in civic education. Invest in qualified teachers for refugees and displaced people, and teach children in their mother language. Incorporate education into the peacebuilding agenda.

PLACE: Distribute public resources equitably in urban areas, involving the community in education planning. Include education in all discussions on urban development. Improve and fund urban planning programmes and curricula to include cross-sector engagement and develop locally-relevant solutions.

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The 2030 Agenda for Sustainable Development grew out of intensifying concerns over the health of the planet and the prosperity of all its inhabitants. Clearly, education matters for people and planet. It transforms the lives of children, youth and adults. The fact that education is a positive force for social, economic and environmental change – that it can significantly influence how we think, perceive and act – is neither new nor revolutionary. And yet important questions remain: How does education function to create societal change? In what contexts does it matter more or less? Which types of education have lasting impact on sustainability issues? Answers to these questions are critical as concrete proposals for improving economic, social and environmental sustainability are being considered.

“ There are concerns that evolving global conditions may weaken the impact of education ”

primary and secondary education are substantial, not only for the individuals involved but also for their families, communities and workplaces. Adult men and women

who have completed some secondary education tend to be more environmentally aware, more resilient to the impact of climate change, more productive and able to generate income, and more likely to live healthier lives, be politically engaged and exercise greater control over their lives. The effects of broadening access to girls and women, in particular, are numerous and intergenerational.

Projections for the 2016 Global Education Monitoring Report (GEM Report) (UNESCO, 2016) underscore the stakes involved in universalizing primary and secondary education by 2030. Enabling every child in the world to complete 12 years of schooling would not only catalyse education progress more broadly (e.g. in many targets of the education goal, Sustainable Development Goal 4), but would also help save millions of lives among children who might not otherwise reach age 5 and among those residing in disaster-prone areas. It would also improve overall worker productivity and economic growth.

Concern exists, however, that evolving global conditions – social, economic, political and environmental – may weaken the impact of education. Over the past two centuries, the world economy has been massively transformed through industrialization, mechanization, computerization, innovation and globalization, the latest iteration resulting in today’s ‘knowledge economies’. These transformations have created enormous wealth for some and, in many instances, helped expand sizeable middle classes. At the same time, huge populations throughout the world have been left behind, their

lives and livelihoods remaining vulnerable to economic dislocation or persistent poverty or both. The vicissitudes of economic cycles, which often exacerbate political insecurity and violent conflict, have forced millions of families and even whole communities to relocate under difficult circumstances.

Despite challenges, the worldwide movement to universalize a long cycle of education and improve learning levels gathers steam. These aspirations are deeply embedded in the aims, policies and plans of almost all countries, regardless of population, location and degree of development. Education, which historically served elite interests, has been made more accessible, expanded into national systems that seek to provide all students, even those in hard-to-reach locations and marginalized groups, with the opportunity to become educated and skilled. The aim of good quality education for all has become the norm, driving national commitments and the activities of international agencies and external donors, bolstered by human rights conventions.

If it were to be achieved, the new global education goal would mean that each and every child, regardless of birth circumstances, would have a chance to acquire valuable knowledge, skills and attitudes that could improve the quality of their lives from personal, civic, social and employment-related perspectives. But the scale of the challenge is pronounced: 263 million children and adolescents are currently excluded from primary and secondary education and unable to acquire relevant skills and competencies for life and work. Education's many benefits now go disproportionately to some individuals at the expense of others. The ones who are far less likely to reap them include people who face discrimination, are unhealthy, lack access to basic services and live in remote or sparsely populated areas.

The 2016 GEM Report (UNESCO, 2016) emphasizes the inequity and unsustainability of global and national economies, and the various roles education plays in this respect. Modern economic systems have increased the value of and demand for educated labour, especially as a source of innovation-led economic growth. Economic benefits and social status accrue to those with credentialed knowledge and skills, leaving behind huge numbers of people who may never have had access to school or to lifelong learning opportunities and who therefore face persistent obstacles in obtaining decent work or escaping from working poverty.

From a sustainability perspective, the world's wealthy,

with their high levels of education and standards of living, leave large ecological footprints and make the planet less sustainable. Educated people may have considerable knowledge about environmental and other progressive issues, but do not always act on it. Education and qualifications do not necessarily translate into desirable outcomes, such as greater tolerance for diversity, respect for women and men, less risky health behaviour, waste prevention, more balanced diets and a commitment to social justice. At the same time, the least educated and most vulnerable contribute little to the planet's burdens. And yet they are most exposed to the impact of climate change and increasingly frequent and severe natural disasters. Inequality in opportunity and living conditions, including in access to education of good quality, are especially visible in our growing cities and urban areas, which has often led to civil unrest and discontent.

Education cannot serve as a cure-all for society's problems. Global social and economic challenges are interdependent, involving sectors beyond education, and education is provided within the context of entrenched social and political institutions that are resistant to change. Radical transformation of how and what we consume and produce, and of the basis for sharing economic rewards, requires commitments that must cross economic sectors and political boundaries. At the same time, education reforms are no quick fix if not reinforced by changes in the home, workplace and community that result in altering, for example, stereotypical gender roles or attitudes towards people who face discrimination on any grounds, from ethnicity to disability.

Politics, economics, health, water, sanitation, energy, migration, conflict and climate have direct effects on education systems. Poor air quality or extreme weather can destroy schools, force them to close or make learning nearly impossible. Groups such as people displaced by climate change or conflict, economic migrants and poor slum dwellers can place enormous pressure on education systems. Education is much affected by the context in which it operates.

Yet formal, non-formal and informal education can lay the groundwork for transforming institutions and norms to address today's pressing challenges in tangible ways. Schools can deliver knowledge on sustainability issues and promote good environmental, health and sanitation practices. When designed smartly, and conveyed by well-prepared teachers, school-based programmes can inculcate values of tolerance and equality.

Evidence gathered for this report suggests that education systems do not change quickly, despite well-articulated intentions, since content and pedagogy often reflect deeply set social, economic and environmental norms. And in many instances, schools lack adequate financing for transformation, even if school leaders are committed to this aim.

Several of the 2016 GEM Report (UNESCO, 2016) chapters document a wide range of non-formal and informal learning initiatives, especially targeting girls and women, that fill gaps in useful knowledge – such as how to demand local services or fight for justice – and equip learners for stronger economic and political participation. The report also highlights learning-focused actions by national and local governments, civil society organizations and private companies, recognizing the ways in which education and lifelong learning matter for reducing inequality, encouraging sustainable transport and waste prevention, and both preventing conflict and natural disasters and recuperating from them.

The 2016 GEM Report (UNESCO, 2016) also pays special attention to the importance of developing integrated approaches to solve complex, collective problems. Such strategies align well with key points made in the 2030 Agenda for Sustainable Development. However, the Partnerships chapter finds that the notion of integrated planning, though part of the post-2015 development discourse, still exists mostly on paper and there is limited evidence of its benefits, partly because there is little appetite for difficult collaborative arrangements. Few countries have genuinely pushed for integrated actions to provide, for instance, early childhood development or joint basic services. Without strong political incentives and adequate financial backing, planning and implementation in most contexts will remain in silos. We know the many ways education matters for shaping knowledge, values and attitudes; education and lifelong learning policies targeting all learners of all ages must be given their rightful priority and embedded in integrated national and local planning efforts.

For education to truly be transformative, ‘education as usual’ will not suffice. Schools need to become exemplary places that breathe sustainability, finding ways to be more inclusive, participatory and healthy, as well as carbon-neutral and producing no waste and pollution. Formal and non-formal learning needs to foster thinking that is more relational, integrative, empathic, anticipatory and systemic.

POLICY RECOMMENDATIONS¹

Keeping all of the above discussion in mind, the GEM Report presents general and specific policy recommendations for how education systems can more effectively contribute to sustainable development:

- Support collaborations and synergies across all sectors and partners. Since systemic problems require multiple actors and diverse perspectives, stronger efforts are needed to involve all partners at the local and national level and across sectors. Finance and planning ministries need to engage in more systemic planning. Education ministries should be better linked with ministries of health, gender, environment and labour. Education experts need to learn from and work with civil society and communities, which already carry out an impressive array of education and training. Stronger focus is required on cross-sector collaboration and integrated perspectives in the activities of civil society and the private sector, as well as in urban planning and research and development strategies. The private sector, civil society, multiple sectors of government activity and international actors should work together to fund various facets of education, since education matters for all aspects of sustainable development.
- Integrate formal and non-formal education and training into government efforts to tackle complex problems. Education can be an important tool for capacity-building in all public sectors. Many of the Sustainable Development Goal targets will require the specialized skills and expertise education can provide, for instance in water management or addressing global health and climate risks. The case for education interventions should focus on both immediate and longer-term cross-sector benefits that education solutions can provide, so that funds additional to those traditionally targeted for education can be used. Governments and other stakeholders also need to better investigate and invest in combinations of integrated interventions that are likely to have multiplier effects for several development outcomes, including education. Investment is particularly needed

“ For education to truly be transformative, ‘education as usual’ will not suffice ”

1. The recommendations presented in this chapter are based on the full 2016 GEM Report: *Education for People and Planet: Creating Sustainable Futures for All* (UNESCO, 2016).

in low income countries so they can build their own expertise by improving higher education and vocational institutions, as well as informal adult learning initiatives.

- Education can be an important means of reducing inequality but cannot be seen as the sole solution. Making primary and secondary education of good quality widely accessible can enable large numbers of individuals and their families to raise their incomes above the poverty line. Expanding educational opportunities to marginalized groups and further reducing gender inequality in the school system are crucial to reduce disparity in labour market outcomes, much of which is accounted for by lower levels of attainment. Policy-makers must ensure that changes in labour market institutions, such as technological progress and easing of labour market restrictions, do not excessively penalize lower income individuals, who are disproportionately employed in lower paying and less secure jobs, often in the informal sector. At the same time, cooperation across all sectors of society and the economy is needed to reduce prejudice and any policy-related obstacles to full economic participation by women and minority groups.
- Increase the level and predictability of education system financing. Education funding needs to be both adequate and predictable to ensure the provision of good quality primary and secondary education, especially to marginalized groups. This would entail ensuring appropriate inputs and teachers, and transforming school systems to better inculcate values of social and environmental sustainability in addition to a specific set of cognitive skills. Improved financing is also critical to support non-formal and

“ Education can be an important means of reducing inequality but cannot be seen as the sole solution ”

informal learning initiatives instead of waiting for the longer-term effects of formal systems. Such initiatives are often innovative, localized, targeted to adults and capable of helping address pressing issues such as disaster risk resilience and conflict prevention.

More specifically, stakeholders working to promote the sustainable development agenda should consider the following actions to expand education's focus and create more equitable opportunities for all:

PROSPERITY

In order to reduce poverty and stimulate green and inclusive economies:

- Invest in teaching green skills in formal and non-formal programmes. Coordinate green-focused curricula through cooperation between education and training systems, policy-makers and industry.
- Train and support teachers and instructors at all education levels and in the workplace to enable learners to acquire green skills.
- Ensure universal access to good quality education that emphasizes skills and competencies for entry into economically productive, environmentally sustainable industries.
- Develop short-term strategies focused on workforce retraining and upskilling, together with longer-term strategies to improve or revise curricula in secondary education, initial higher education and vocational training.
- Incentivize universities to produce graduates and researchers who address large-scale systemic challenges through creative thinking and problem-solving.
- Promote cooperation across all sectors to reduce policy-related obstacles to full economic participation by women or minority groups, as well as discrimination and prejudice that also act as barriers.

PARTNERSHIPS

In order to ensure adequate financing, policy coherence and multisector capacity:

- Make links with tax authorities and others to improve tax-related knowledge through formal education.

- Develop equitable funding mechanisms to address in-country disparities in education funding.
- Use progressive public finance policies to ensure adequate funding of lower levels of education, and combine public allocations and a well-designed system of student grants and loans to finance upper levels of technical, vocational and tertiary education.
- Increase multilateral aid mechanisms and engagement with the private sector, learning from health sector efforts to increase and diversify funding.
- Mobilize domestic resources, stop corporate tax evasion and eliminate fossil fuel subsidies to generate government revenue for fundamental needs such as education and health.
- Provide political and financial support for planning and implementation of education and other activities to be carried out with an integrated approach to policy and development at the national and local levels. Develop knowledge exchange programmes to learn from successful integrated policies involving education.
- Support multistakeholder governance for the sustainable management of natural resources and of public and semi-public rural, urban and peri-urban spaces.

PLANET

In order to lessen environmental degradation and the impact of climate change:

- Develop whole-school approaches that promote environmental teaching, learning, planning and operations by drawing attention to the ties between the environment, economy and culture.
- Provide disaster risk-resilience training in schools and equip learners with the means to support communities in times of disasters.
- Fund efforts to ensure that education infrastructure is resilient to climate change.
- Engage community elders in curricular development and school governance, produce appropriate learning materials and prepare teachers to teach in mother languages.
- Promote the value of indigenous livelihoods, traditional knowledge and community-managed or -owned land through actions such as land conservation and locally relevant research.
- Initiate large-scale awareness campaigns that 'nudge' people to engage in sustainability practices and behaviour.
- Work with community and religious leaders to spread ideas about environmental stewardship, and incentivize companies that incorporate sustainability into workplace practices.
- Scale up non-formal education initiatives promoting family planning and maternal well-being.
- Increase funding of research and development that promote technological innovations in energy, agriculture and food systems.

“ All schools should provide meals, access to water and sanitation, adequate gender-specific toilets and child-friendly spaces ”

PEOPLE

In order to ensure that all human beings can fulfil their potential in dignity and equality and in a healthy environment:

- Target marginalized groups consistently left behind by adequately redistributing existing resources and ramping up funds to improve access to good quality education.
- Support strong investment in early childhood care and education, especially for infants and toddlers, who gain lifelong benefits from participation in integrated interventions combining stimulation with health care and nutrition supplementation.
- Promote partnerships between education ministries and ministries responsible for health, water and sanitation, and gender issues, to help simultaneously improve multiple, linked and connected outcomes.
- Fund integrated delivery of basic services in schools. Ensure that all schools provide meals, access to water

and sanitation, adequate gender-specific toilets and child-friendly spaces, and can deliver curricular interventions focused on behavioural change, such as hygiene education, sexual and reproductive health education, and obesity prevention education.

- Provide awareness campaigns and training to boost innovation in service delivery, such as e-government and participatory budgeting.
- Fund community-oriented education and training programmes in relation to health and sanitation.
- Ensure all girls complete primary and secondary education to promote their autonomy and decision-making abilities.
- Invest in programmes that address gender stereotypes and roles by engaging men and women in group education sessions, youth-led campaigns and multipronged empowerment approaches.
- Support media-based awareness campaigns, the development of positive role models and other initiatives to change gender norms inside and outside the education system.
- Support efforts to improve participation of girls and women in science, technology, arts and design, and mathematics so as to improve employment prospects.
- Support social protection programmes, health policies and child-care support that improve maternal education and facilitate men's and women's employment-related decision-making.

PEACE

In order to foster peaceful, just and inclusive societies that are free from fear and violence:

- Expand the emphasis on global citizenship and peace education in curricula.
- Invest in civic education programmes that contribute to a functioning justice system, including participation and access for marginalized communities.
- Promote learning emphasizing the values of tolerance and peace education to help build less violent and more constructive societies.
- Teach in children's mother languages. Countries with high proportions of minorities should consider training teachers in methods for teaching second-language learners, in both initial teacher training and professional development.
- For refugees and internally displaced persons, implement policies that expand the pool of qualified teachers proficient in their languages, and address the issue of official validation and certification of learning by refugees. Refugees who were teachers in their home countries could be an important resource.
- Incorporate education into official foreign policy, transitional justice efforts and the peacebuilding agenda when trying to prevent and recover from conflict situations.
- Ensure curricula and learning materials are not biased or prejudiced against ethnic and minority groups. Engender resilience in students and communities in post-conflict societies through curricula, teacher training, transitional justice programmes and supporting integrated schools.
- Fund civil society organizations and other institutions that provide legal and political education in communities.

PLACE

In order to foster sustainable, inclusive and prosperous cities and other human settlements:

- Ensure urban areas distribute public resources equitably, including amenities and good quality teachers, so as to promote social inclusion and reduce inequality resulting from education disparity.
- Take steps to halt segregation stemming from increased opportunities to choose between public and private schools.
- Work to reduce school-based violence, including gender violence, and discriminatory attitudes among teachers.
- Develop local autonomy and localized system-wide education planning, especially in populous African and

“ We should educate and engage with those who are disenfranchised, and include them in urban planning ”

Asian cities, considering education as a local as well as national issue.

- Better incorporate education into local, national and global agendas focused on improving cities and other human settlements.
- Educate and engage with those who are disenfranchised, include them in planning, and collaborate with civil society actors who work with them.
- Fund schools and training programmes for slum dwellers and other disadvantaged groups who live in absolute poverty, so that assistance for them is not limited to basic services such as housing and water and sanitation.
- Fund urban planning education to increase the numbers of planners, and promote integration of education as well as multidisciplinary approaches.
- Improve urban planning curricula to include cross-sector engagement, community engagement, learning by doing and the development of locally relevant solutions.
- Involve communities in any processes to consolidate and improve schools in rural and other areas affected by population declines due to migration.
- Monitor and address any unintended consequences of the growth of knowledge economies, such as gentrification and middle class flight, with strong economic and housing policies to limit social segregation and societal discontent.

Partnering for Prosperity: Education for green and inclusive growth

The world economy needs deep transformation in order to become more sustainable and inclusive. Education and lifelong learning are needed to make production and consumption sustainable, to provide green skills for green industries, and to orient higher education and research towards green innovation. At the same time as becoming greener, the economy must also become more inclusive. With widespread poverty and inequality, economic growth has not benefited all people. Prosperity must be conceived in ways that leave no one behind, closer integration of education, economic and employment policies would help promote inclusion of all people in the economy.

Partnering for Prosperity: Education for green and inclusive growth, an extract of the 2016 *Global Education Monitoring Report* and its Gender Review, explores the role of education in fostering environmentally sustainable and economically inclusive development.

It provides evidence on the links between education and skills acquisition, on the one hand, and long-term economic growth, on the other. It recognises that education must transform itself in order to keep up with the changing face of work. Green and transferable skills should be taught in schools, higher education institutions and the workplace. The greening of industries requires both the production of more high-skill workers and the continuous training and education of low and medium skill workers, often on the job. It also warns that while education contributes to economic growth, education systems must be careful not to encourage unsustainable lifestyles; all learners must acquire the knowledge and skills needed to promote sustainable development.

The 2030 Agenda for Sustainable Development, which was adopted by all governments in September 2015, views the social, economic and environmental challenges of our time as indivisible. This publication demonstrates the need for:

- Cooperation - to ensure adequate financing, develop and diffuse technological innovation, and build capacity to implement national plans;
- Systemic improvement – to enhance policy coherence, build multistakeholder partnerships, and improve data, monitoring and accountability;
- Favourable macroeconomic conditions – including inclusive trade, debt sustainability and healthy investment.

Fulfilling the Sustainable Development Goals (SDGs) requires integrated plans and actions where diverse sectors, types of actors and levels of government have to work together.

“To ensure the SDGs are implemented, everyone involved needs to think, to work, to organise, to communicate and to report in ways that are completely different from what has been done up till now. Education truly is key to a wide appreciation not just of the SDGs but the new ways of thinking and working that are going to be necessary to fulfil them. So the challenge to all of us is to re-learn, and that does not just apply to educators, but it applies to all of us.”

– David Nabarro, Special Adviser on 2030 Agenda
for Sustainable Development

“The 2016 Global Education Monitoring Report is both masterful and disquieting. Education gives us the key tools – economics, social, technological, even ethical – to take on the SDGs and to achieve them. Yet the report also emphasizes the remarkable gaps between where the world stands today on education and where it has promised to arrive as of 2030. The implications are staggering. If we leave the current young generation without adequate schooling, we doom them and the world to future poverty, environmental ills, and even social violence and instability for decades to come. The 2016 GEM Report provides a plethora of insights, recommendations and standards for moving forward.”

– Jeffrey D. Sachs, Special Adviser to the UN Secretary-General
on the Sustainable Development Goals

