



A Curriculum Framework for the Sustainable Development Goals

First Edition

July 2017



The Commonwealth



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Foreword

The 2030 Agenda for Sustainable Development marks a paradigm shift in the global framework for development and presents a unique opportunity to reorient efforts towards a new path for development with sustainability at its core. Education is central to this and to the achievement of all 17 Sustainable Development Goals (SDGs). Education directly relates to one goal (SDG 4) but cuts across the entire SDG agenda.

At the 19th Conference of Commonwealth Education Ministers (CCEM) held in The Bahamas (June 2015), ministers reinforced the centrality of education for building resilience and preparing the next generation of Commonwealth citizens to contribute positively to the social, environmental and economic development of their communities. Ultimately, ministers highlighted the pivotal role that education has in achieving sustainable development and driving the SDGs.

Given this and following the recommendations made at the 19th CCEM, the Education Section of the Health and Education Unit within the Commonwealth Secretariat has developed a *Curriculum Framework for the SDGs* to support member countries in addressing all 17 SDGs through education and learning.

Goal 4 of the Sustainable Development Goals seeks to ensure “inclusive and equitable quality education and promote lifelong learning opportunities for all”. Within the framework, a life course approach is followed, reinforcing the need for lifelong learning and for all citizens to participate in achieving the SDGs.

It is envisioned that this framework will help countries to develop successful learners, confident individuals and responsible citizens who are resilient and uphold the core values and principles of the Commonwealth, as declared in the Commonwealth Charter, and who strive for sustainable development. The framework aims to ensure that citizens develop the knowledge, skills, values and attitudes to flourish in life, learning and work environments, and to appreciate their place in a diverse world, while building and strengthening pathways to peace and tolerance.

The *Curriculum Framework for the SDGs* allows for a high degree of flexibility through the non-prescriptive nature of its content. It is hoped that this framework will serve as a guide for countries to conceptualise, review or further develop their national curricula and ensure that education is integral to any strategy to create a resilient generation that will advocate for action and the attainment of the SDGs in a holistic, integrated manner. It will provide conceptual support for teacher training, adult learning and community development. It also reaffirms the centrality of education to the multiple dimensions of sustainable development.

We give thanks to those who have contributed to the development of this framework, especially Drs Zainal Abidin Sanusi, Elvis Eze, Emily Walmsley and Nicholas Watts, and are greatly appreciative of their input. We acknowledge the participants in the Curriculum Framework Technical Meetings (particularly representatives, including those from ministries of education and high commissions, from The Bahamas, Fiji, Kenya, Malaysia and South Africa) and the members of the Commonwealth Accelerated Development Mechanism for Education Technical Working Group. We thank the Commonwealth Education Ministers Action Group for their endorsement of this framework in January 2017. We also express our appreciation to the following within the Commonwealth Secretariat for their contribution and collaboration: the Health and Education Unit, the Economic Policy Division, the Gender Section and the Sports for Development and Peace Section.

Dr Josephine Ojiambo
Deputy Secretary-General, Commonwealth Secretariat

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Abbreviations

ADHD	attention deficit hyperactivity disorder
CCEM	Conference of Commonwealth Education Ministers
DRR	disaster risk reduction
ECCE	early childhood care and education
ECOSOC	United Nations Economic and Social Council
FAO	Food and Agriculture Organization of the United Nations
FGM	female genital mutilation
GDP	gross domestic product
GPE	Global Partnership for Education
HEU	Health and Education Unit of the Commonwealth Secretariat
ICT	information and communications technology
IEEE	Institute of Electrical and Electronics Engineers
ILO	International Labour Organization
MDGs	Millennium Development Goals
NGO	non-governmental organisation
ODA	official development assistance
PTSD	post-traumatic stress disorder
SAQA	South African Qualifications Authority
SCBD	Secretariat of the Convention on Biological Diversity
SDGs	Sustainable Development Goals
SPC	sustainable production and consumption
STEM	science, technology, engineering and mathematics
TVET	technical and vocational education and training
UN	United Nations
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
UNODC	United Nations Office on Drugs and Crime
UNWCD	United Nations World Commission on Environment and Development
WASH	water, sanitation and hygiene
WHO	World Health Organization

1. Background

'The concept of education as a social process and function has no definite meaning until we define the kind of society we have in mind.'

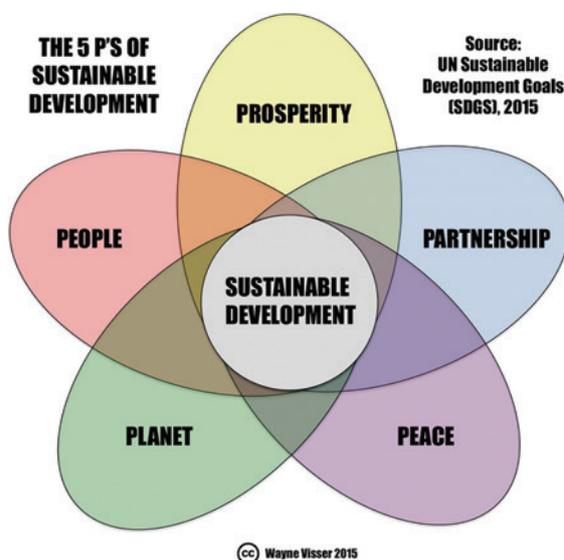
(Dewey 1916)

1.1 Taking forward the 2015 Sustainable Development Goals

In September 2015, the 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs) detailed therein were formally adopted at the United Nations (UN) Sustainable Development Summit. The SDGs succeed the Millennium Development Goals (MDGs) and guide the global path of sustainable development after 2015.

The 2030 Agenda for Sustainable Development is a plan of action for people, planet and prosperity, with countries and all stakeholders acting in collaborative partnership to implement this plan (see Figure 1.1). The Agenda also seeks to strengthen universal peace and provides a common vision for peaceful societies.

Figure 1.1 The five Ps of sustainable development (Visser 2015)



It is a unanimous call for 'a people-centred and planet-sensitive agenda to ensure human dignity, equality, environmental stewardship, healthy economies, freedom from want and fear, and a renewed global partnership for sustainable development' (UN General Assembly 2014). In his report to the UN General Assembly, *A Life of Dignity for All: Accelerating Progress towards the Millennium Development Goals and Advancing the UN Development Agenda beyond 2015*, the UN Secretary-General recommended the development of a universal, integrated and human rights-based agenda for sustainable development, addressing economic growth, social justice and environmental stewardship, and highlighting the link between peace, development and human rights (UN General Assembly 2013). The UN Secretary-General reiterated much of this in his synthesis report on the post-2015 agenda, *The Road to Dignity by 2030: Ending Poverty, Transforming All Lives and Protecting the Planet* (UN General Assembly 2014).

The 2030 Agenda recognises that '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' (UN General Assembly 2015a) and that an integrated approach to implementation is a key factor.

Our Common Future appeared in 1987 and provided the first widely used definition of sustainable development as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (United Nations World Commission on Environment and Development [UNWCD] 1987).

The 2030 Agenda and the SDGs provide a comprehensive vision and framework for all populations across the life course. They encourage transformational change within societies and economies in a more sustainable direction, and they seek to incorporate and balance the three dimensions of sustainable development (economic, social and environmental).

The UN Secretary-General's synthesis report on the post-2015 agenda (UN General Assembly 2014) retains the 17 SDGs developed by the

Open Working Group of Member States. The nature and balance of the challenges that the universal goals of the SDGs represent are specific to each national context. In the same way, the 17 goals can be rearranged, aggregated or clustered according to the needs of each member state.

In the synthesis report, the UN Secretary-General (UN General Assembly 2014) notes 'in particular, the possibility of maintaining the 17 goals and rearranging them in a focused and concise manner that enables the necessary global awareness and implementation at the country level', as well as providing some conceptual guidance.

Figure 1.2 Overarching elements of the SDGs (2015–2030) (Health and Education Unit of the Commonwealth Secretariat [HEU] 2016)



One way to frame the SDGs would be to consider the three dimensions of sustainable development under an integrated agenda for economic, environmental and social solutions, as shown in Figure 1.2. This builds upon the core principles of sustainable development (including social development, environmental development and economic development) as described in *Our Common Future* (UNWCD 1987) and taken forward under the Education for Sustainable Development Agenda.

Figure 1.2 shows the 17 SDGs clustered according to the main components of sustainable development, which sit below the overarching theme of peace, justice, equity and gender. This is all underpinned by working in partnership on a global scale. The key words from each SDG are highlighted in colour and clustered under relevant areas to demonstrate multisectoral working.

The three core pillars represent an old concept of sustainable development. The 2030 Agenda moves towards integration of the three pillars and takes into account the interdependence of environmental, economic and social factors while recognising the realities of different national needs

and capacities. The implementation of the SDGs will require knowledge and support to empower people through a holistic approach. All sectors will have a key role to play in delivery of the SDGs, with education and learning as key enablers.

SDG 4 aims to 'Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all'. Lifelong learning refers to learning that takes place across all life phases and 'includes learning behaviours and obtaining knowledge, understanding, attitudes, values and competences for personal growth, social and economic well-being, democratic citizenship, cultural identity and employability' (South African Qualifications Authority [SAQA] 2013). It also covers education in formal, informal and non-formal contexts (SAQA 2015).

The crucial role of education in achieving sustainable development was initially stressed at the UN Conference on Environment and Development, held in Rio de Janeiro in 1992, through Chapter 36 of its outcome document entitled *Agenda 21* (UN Conference on Environment and Development 1992). The role of education for sustainable development was also emphasised in paragraph 233

Figure 1.3 Clustering of SDGs according to six essential elements (UN General Assembly 2014)



of *The Future We Want*, the outcome document of the UN Conference on Sustainable Development, Rio +20, in 2012 (UN General Assembly 2015b).

Another way to cluster the SDGs would be according to the six 'essential elements' for delivering on the SDGs that the UN Secretary-General's synthesis report (UN General Assembly 2014) introduces: dignity, people, prosperity, planet, justice and partners. Figure 1.3, which is taken from the same report, expands on these six elements.

Education acts as a cornerstone of the post-2015 agenda – both as a goal in itself and as a catalyst for broader change.

1.2 The centrality of education

Education is critical in shaping individual and collective knowledge, skills, values and attitudes to enable people to move along pathways towards sustainable development, and a catalyst for development itself. It is a key determinant of social and economic transformation, and an essential precursor to peace, tolerance and sustainability. It equips learners of all ages with the knowledge, skills, values and attitudes needed to be responsible global citizens, such as respect for human rights, gender equality and environmental sustainability.

It has been demonstrated that education has a multitude of benefits. Key findings from research by World Bank economists (Montenegro and Patrinos 2013, 2014) into the private returns of schooling (where private returns are an estimate of the proportional increase in the labour market earning from each additional year of schooling completed for an individual) suggest that in general the average rate of return for an additional year of schooling is 10 per cent. In addition to increasing economic growth and reducing poverty, quality education provides numerous other human development outcomes, including improved health and well-being, a lower likelihood of conflict and improved socio-economic prospects for future generations (Montenegro and Patrinos 2013, 2014; United Nations Children's Fund [UNICEF] 2015).

Target 4.7 of the SDGs signals the need to ensure that individuals contribute to sustainable development through enhancing their competencies across the learning phases: 'By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development,

including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development'.

As such, education is both a goal in itself and a key enabler for ensuring the achievement of the other 16 SDGs.

1.3 Mandate

19th Conference of Commonwealth Education Ministers

At the 19th Conference of Commonwealth Education Ministers (CCEM) held in The Bahamas in 2015, the role of education in sustainable development was highlighted by ministers in the Nassau Declaration (Commonwealth 2015):

- Paragraph 2: 'Education for Sustainable Development is recognized as a priority for future planning by Ministers, as well as the role of education at the heart of the process for driving the SDGs.'
- Paragraph 5: 'The role of education for building resilience is championed by Ministers as a key factor in combating issues of vulnerability, particularly those faced by small states, such as climate change, migration, mobility, and financing.'
- Paragraph 6: 'Ministers also acknowledge the wider responsibility of member-states to ensure the continued relevance of education, ensuring that it prepares the next generation of Commonwealth citizens to contribute positively to the social and economic development of their communities.'

1.4 Rationale for the Curriculum Framework

In the light of the global adoption of the 2030 Agenda, the mandate of the 19th CCEM and the priorities of the Commonwealth Secretariat's Strategic Plan 2013/14–2016/17, Curriculum Framework for the SDGs to support countries in addressing all 17 SDGs, and their 169 targets, through education. This framework reinforces the connections between the SDGs through a holistic,

life course approach (early childhood care and education (ECCE), primary education, secondary education, technical and vocational education and training (TVET)/skills development, tertiary education, and adult education and learning), taking into account the SDG targets and the relevant indicators.

The Curriculum Framework focuses on relevance to enable the delivery of the SDGs; relevance is integral to quality of education. A relevant curriculum provides space for learners to explore,

analyse and engage with their environment and the world around them and, in the process, strengthen the knowledge and skills that will enable them to understand and deal with complex issues that affect the environment and society now and in the future. The Curriculum Framework will articulate this vision of learning.

Resources including the Curriculum Framework can be found online at the Commonwealth Education Hub (<https://www.thecommonwealth-educationhub.net/>).

2. Outline of the Curriculum Framework for the SDGs

2.1 Aim of the Curriculum Framework

The Curriculum Framework is intended to be a flexible, non-prescriptive tool that follows a competency development model through a combination of knowledge, skills, values and attitudes. It also aims to enable the delivery of the SDGs by ensuring that each population has the relevant skills, knowledge, values and attitudes for social, economic and environmental development, and to work in partnership to create peaceful societies.

By serving as a guide for member countries to review or develop their national curricula, the Curriculum Framework aims to ensure that all citizens of the Commonwealth develop the knowledge, skills, values and attitudes they need to flourish in life, learning and work, and to appreciate their place in a diverse world, while building and strengthening pathways to peace and tolerance. It aims to help all those involved in planning and delivering education and learning, across all sectors and settings, to bring about the transformational changes needed for people to lead fulfilling lives. The knowledge, skills, values and attitudes identified are relevant from the early years right through to adult learning, and they set the foundation for a holistic, values based participatory and action-oriented education system, which is essential for generating positive change and sustainable development.

The Curriculum Framework can support the design, delivery and evaluation of national curricula across the Commonwealth, set the foundations for research and development, provide consistency across programmes for achieving the SDGs, and support the creation of learning and evaluation tools to align with the framework.

This framework will guide countries in defining their contextual needs and the basic requirements related to competencies that must be demonstrated or acquired in order to achieve the objectives of the SDGs through education, and within the current or evolving policy contexts.

The framework is therefore necessarily broad and can be applied to diverse learning contexts, including formal, informal and non-formal learning. It provides a holistic picture and a lens or model to help frame the entire curriculum in alignment with sustainable development (assessing countries' strengths and weaknesses as well as current and future challenges). It will provide a tool to ensure that the SDGs achieve transformative outcomes through education by developing a multisectoral mechanism to catalyse work across sectors.

The framework is a tool for orienting towards sustainability through education. It supports a holistic life course approach involving:

- new paradigm thinking (systems thinking, integrative thinking, critical and creative thinking);
- new learning and delivery approaches;
- integration of different types and forms of knowledge including indigenous and traditional knowledge systems;
- core competencies;
- the interconnectedness of the challenges and linkages between the SDGs;
- the integrated continuum of the complex interplay of social and environmental factors mixed with biological, behavioural and psychological issues that help to define learning outcomes and skills development across the course of a person's life;
- values, attitudes and ethics, including inclusion and democracy, respect for people and all life forms, equity and social justice, quality of life, care and duty, and sustainability;
- strengthened equity, tolerance and respect for others;
- enhanced individual and collective responsibility; and
- new learning delivery and approaches.

'Quality education fosters creativity and knowledge, and ensures the acquisition of the foundational skills of literacy and numeracy as well as analytical, problem solving and other high-level cognitive, interpersonal and social skills. It also develops the skills, values and attitudes that enable citizens to lead healthy and fulfilled lives, make informed decisions, and respond to local and global challenges through education for sustainable development ... and global citizenship education ... We also stress the importance of human rights education and training in order to achieve the post-2015 sustainable development agenda.'

- Education 2030: Incheon Declaration and Framework for Action: Towards Inclusive and Equitable Quality Education and Lifelong Learning for All (UNESCO 2015).

The life course approach aims to assist learners in developing the skills they will need for learning, life and work in an evolving world with ever-changing challenges, based on the perspective that each life stage exerts an influence on the next, combined with social, economic and environmental influences throughout the life course (Section 2.5).

The framework includes the following three components, which make up the competencies that learners develop (i.e. integrated competencies that consist of an interrelated set of competencies including foundational knowledge): **(1) knowledge, (2) skills, and (3) values and attitudes**. These competencies are fundamentally interconnected, and support learning across the life course.

Appropriate knowledge and understanding provide fundamental opportunities for skills development and sharing of values and attitudes, while values and attitudes enable skills to be successfully deployed within the knowledge context.

2.2 Purpose of the Curriculum Framework

The purpose of the framework is to develop successful learners, confident individuals, and responsible citizens who are resilient and uphold the core values and principles of the Commonwealth as declared in the Commonwealth Charter (Commonwealth 2013), which recognises that 'sustainable development can help to eradicate poverty by pursuing inclusive growth whilst preserving and conserving natural ecosystems and promoting social equity'. Pursuit of sustainable development requires educational and learning curricula that inspire thinking, doing, being and becoming agents of change.

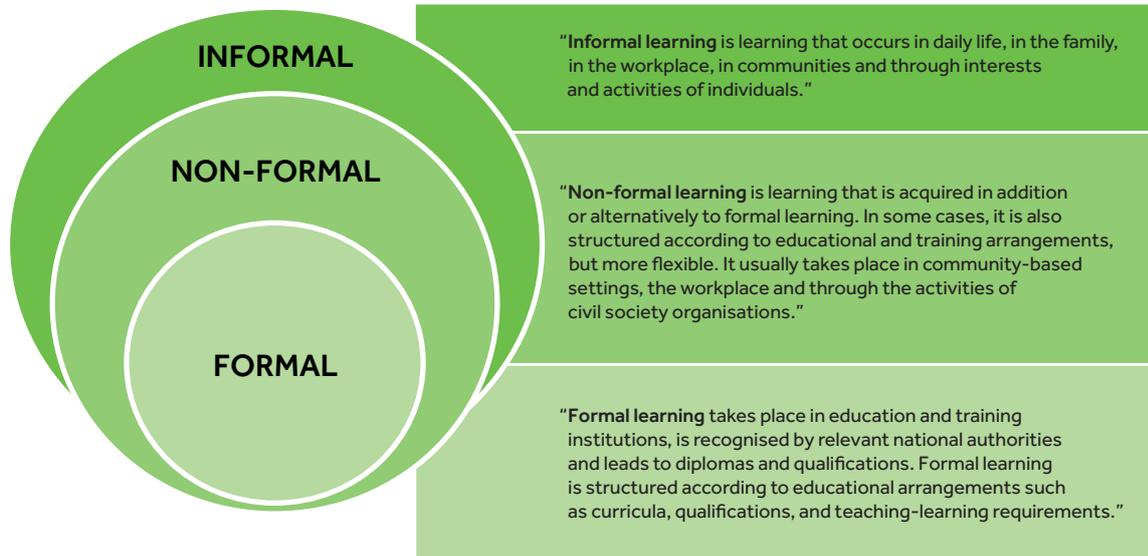
Reorienting national curricula is key to addressing all 17 SDGs through education. Reorienting education requires teaching and learning that guide and motivate learners to pursue sustainable livelihoods, to participate in a democratic society, and to live in a sustainable and responsible manner. It calls for a mind shift – learning to do things differently with a critical mind and for the common good.

The Curriculum Framework should act as a catalyst for change through reimagining courses with a view to helping to create an equitable and sustainable social order. The framework explores the progression of learning outcomes across all levels of learning – formal, non-formal and informal education (Figure 2.1) – and learning approaches, all of which are important for the effective implementation of the SDGs. This means learning throughout life to support the achievement of the SDGs.

Formal education, based on curricula, assessments and formal qualifications, should work in complementarity with both of the following:

- the non-formal education sector (e.g. education provided by museums, non-governmental organisations (NGOs), public health educators, agricultural extension officers, communities and adult educators, and other learning environments usually with no formal accreditation but following some structured form of learning that may be based on a curriculum);
- the informal education sector (e.g. education provided by radio programmes, the internet, workplace interaction and oral communication, and chance education in general).

Figure 2.1 Different learning forms (adapted from UNESCO Institute for Lifelong Learning 2012)



In order to apply the lifelong learning approach to the enhancement of the SDG agenda, the Curriculum Framework is organised according to the life stage model and deals with each of the SDGs according to the life phases across which learning occurs. It places these against the backdrop of the lifelong learning continuum – from preschool through to post-schooling and including non-formal education. Learning about the SDGs is therefore a task that cuts across all educational settings, all age groups and all life stages, with educators needing to promote sustainability competencies at the appropriate levels of complexity.

The framework highlights learning content and outcomes, the skills, attitudes and values that are desirable at each of the life stages, and shifts learning from being only content driven to being outcome driven, action oriented and participatory. The aim is that all learners – adults, children and young people – can become engaged in promoting the transformation required for sustainable development.

The key role played by education in the attainment of the SDGs parallels the expansion of access to basic schooling and the growing demand for secondary and tertiary education, and technical and vocational skills development, as well as the expansion of adult basic education across the developing world. The life phase organisation of this framework takes account of learning across

the lifelong learning continuum, beginning at preschool and continuing through primary and secondary school to post-schooling, including tertiary, technical and vocational education, and also adult education, in order to facilitate the role of educators. Organising the framework in terms of the life phase approach makes it possible to harmonise, sequence and operationalise the SDGs across the life phases so that educators can play a role in promoting sustainable development through teaching and learning.

2.3 Core competencies

Sustainable development depends critically on the competencies of all citizens of the Commonwealth, with competencies understood to cover knowledge, skills, values and attitudes that build on individual capacity. These include team building, communication, decision making, problem solving, sense of community, self-esteem, personal responsibility, empathy, moral development, ethics, values, resilience and improved inclination for educational achievement.

Alongside traditional learning outcomes, core competencies for achieving the SDGs are:

1. *Envisioning* – being able to imagine a better future. The premise is that when we know where we want to go, we will be better able to work out how to get there. The objective is to establish a link between long-term goals

and immediate actions, and to motivate people to take action by harnessing their deep aspirations.

Under this competency, key elements are:

- identifying relevance and meaning to different people;
- exploring how to achieve change;
- offering direction and inspiration to take action; and
- taking ownership of visions, processes and outcomes.

2. *Critical thinking and reflection* – learning to question our current belief systems and to recognise the assumptions underlying our knowledge, perspectives and opinions. Critical thinking helps people learn to examine economic, environmental, social and cultural structures in the context of sustainable development, and challenges people to examine and question the underlying assumptions that influence their world views by having them reflect on unsustainable practices. Critical thinking leads to confidence in addressing the dilemmas and challenges of sustainable development. It encompasses the knowledge, skills and processes associated with intellectual development.

Under this competency, key elements are:

- developing the ability to participate in change;
- providing a new perspective;
- promoting alternative ways of thinking; and
- developing metacognitive awareness.

3. *Systemic thinking* – acknowledging complexities and looking for links and synergies when trying to find solutions to problems. Systemic thinking helps us recognise that the whole is more than the sum of its parts, and it is a better way to understand and manage complex situations.

Under this competency, key elements are:

- shifts in thinking from 'things' to wholes, and linking these to 'processes' and functions;

- understanding the nature of feedback and how feedback affects system behaviour; and

- integrating decision-making and adaptive management techniques.

4. *Building partnerships* – promoting dialogue and negotiation, learning to work together, so as to strengthen ownership of and commitment to sustainable action through education and learning.

Under this competency, key elements are:

- building a shared vision among a diverse range of stakeholders;
- motivating and adding value to initiatives; and
- communicating, imparting and exchanging information.

5. *Participation in decision making* – empowering oneself and others. This means being involved and involving people in joint analysis, planning and control of local decisions.

Under this competency, key elements are:

- decision making and responsibility for outcomes;
- greater sense of ownership of and commitment to responsible action;
- building capacity for self-reliance and self-organisation; and
- empowering individuals to take action.

Competencies relate to an aggregation of corresponding cognitive and practical skills, knowledge, motivation, values and ethics, attitudes, emotions, and other social and behavioural components that can be pulled together to achieve an aim in a specific setting (Rychen and Tiana 2004). According to the Institute of Electrical and Electronics Engineers (IEEE) reusable competency definition, a competency is defined as any form of knowledge, skill, attitude, ability or educational objective that can be described in a context of learning, education or training: 'The goal of most learning, education and training is to acquire skills, knowledge and ability, i.e. *competencies*. Recognizing and validating the competencies that individuals have or should acquire are also

Core competencies

In this framework, we make reference to a number of competencies, which refer to the amalgam of knowledge, skills, values and attitudes that learners are required to have acquired at the end of a successful learning process.

Often the terms *competence* and *competency*, or *competencies*, are used interchangeably. However, competence is more often used to describe a person's general ability, while competency is more often used to describe the final attainment levels of a learning programme in terms of competencies, with an emphasis on the process of learning and the achievement of learning outcomes.

In this framework, we use the term competencies to refer to the clusters of learning competences, which include the knowledge, skills, attitudes and values that learners should acquire in relation to each of the 17 SDGs across the various life stages and the lifelong learning continuum along which learning occurs. The framework deals with the knowledge, skills, attitudes and values in relation to each of the SDGs and outlines: (a) the knowledge or content areas to be focused on, making provision for the inclusion of indigenous and traditional knowledge topics; (b) the skills to be developed; and (c) the values and attitudes that are desirable for the successful accomplishment of the learning outcome.

The values and attitudes relate to areas such as resilience, ethics, empathy, inclusivity, respectfulness, equity, social justice, care, service and sustainability. These are integral to the cross-cutting or generic outcomes that are desirable from all learning and, in this framework, across all the SDGs. The values and attitudes derived from core competencies are necessary for the successful execution of activities related to the specific learning outcomes for each of the SDGs.

Some of these generic or cross-cutting competencies stress teamwork and working effectively with others as a member of a team, participating as responsible global citizens, being culturally sensitive and developing entrepreneurial abilities.

At a cognitive level, the cross-cutting competencies require learners to collect, analyse, organise and critically evaluate information, to develop skills in problem solving, decision-making and action planning, and the ability to communicate ideas effectively.

fundamental to staffing, recruiting, credentialing, personal advancement, workforce development, curriculum development and policy making' (IEEE 2015).

The competencies outlined in this framework are presented with a view to strengthening equity, tolerance and respect for others and enhancing individual and collective responsibility, and, when integrated into national curricula, can assist in connecting the SDGs to national sustainable development agendas and envisioning better futures for all.

Core competencies are relevant for all SDGs and contribute to all learning. Specific competencies derived from core competencies may be necessary

for the successful execution of activities related to specific tasks or the completion of a specific learning process.

2.4 Methodology and review process

The methodology and review process for developing the Curriculum Framework entailed a number of phases: a literature review, including available national curricula, and consultative processes with member countries and relevant experts and partners. These included several technical workshops, as well as internal cross-divisional discussions and feedback. The literature review and scan aimed not to be exhaustive but,

rather, to indicate key themes for inclusion in the framework. It is intended that these will be explored further by countries and users depending on context and needs. Consultations with member countries (including The Bahamas, Fiji, Kenya and Tuvalu) and experts were aimed at engaging those with strong backgrounds in curriculum development and education policy to advise on gaps, recommend key areas and peer-review the drafts.

It should be highlighted that the development of the Curriculum Framework is an ongoing exercise; this first edition will undergo revision following feedback from readers and users.

The development of the Curriculum Framework involved the identification and description of the competencies that learners should acquire, with an emphasis on the results of learning. In the context of the framework, the following was sought: a set of integrated competencies derived from the core competencies that learners, including adults, need to develop for active and responsible participation in all relevant fields of life and to implement the SDGs, including empathy, ethics, compassionate values, and the ability to express social and environmental concerns and change behaviours. Integrated competencies and learning outcomes are specified in three categories – knowledge, skills, and values and attitudes (Figure 2.2).

The framework is developed as a matrix model with indicative core competencies that could be used to map the 17 SDGs (or as an auditing tool for the 17 SDGs).

2.5 Life course approach

Commonwealth countries acknowledge the importance of effective teaching and learning throughout all learning phases, both in motivating learners to continue learning throughout their lives and in equipping them with the knowledge and skills to do so.

Speaking at the 15th CCEM in Edinburgh in 2003, Amartya Sen stated that the 'nature of the curriculum, is, of course, of obvious relevance to the development of technical skills (such as computing) that facilitate participation in the contemporary world. However, there are also other issues involved, since schooling can be deeply influential in the identity of a person and the way we see ourselves and each other' (Sen 2004).

The need for a change of approach to enhance the performance of the education sector in challenging times is even more relevant today as individuals increasingly negotiate multiple identities.

Greater involvement by children, adolescents, young people and adults in learning in general, and in learning to learn in particular, has the potential to

Figure 2.2 Competencies in the Curriculum Framework

Knowledge and understanding	Skills and applications	Values and attitudes
<ul style="list-style-type: none"> • Understanding of key social, environmental and economic challenges and complexities • Understanding of local, national and global challenges and complexities • Knowledge to respond to these challenges and complexities • Multiple literacies • Lifeskills • Understanding of key socio-political challenges and conflicts • Differential and multiscalar understanding • Systems theory and reflexivity 	<ul style="list-style-type: none"> • Analysis • Factfinding • Listening, observing and problem solving • Independent learning and critical thinking • Goal-setting skills • Planning and decision-making • Ability to identify and solve problems, and to set goals • Effective communication and social integration skills • Capacity to think independently • Self-reflective and reflective skills 	<ul style="list-style-type: none"> • Sense of purpose and hope • Commitment to justice • Confidence, resilience and adaptability • Openness, respect for diversity • Communication, engagement and integration • Responsible, active, productive and engaged citizens • Duty bearers • Commitment to community engagement for constructive responses to societal issues • Self-esteem, self-understanding and clearer sense of identity

contribute to a range of public agendas, including health and well-being, peace, social justice and cohesion, and employability.

This means that national curricula should encourage critical thinking and creative discussions from diverse perspectives, and give learners the opportunity to exchange knowledge and ideas on alternative solutions for economic, environmental and social issues, whether local, national or global. Integrating the topic of the SDGs into a curriculum allows learners to understand their multiple identities, to work out what their roles should be for living together on a common planet and building a better future in an interdependent world at local, national and global levels. Learning can take place in a range of learning spaces, from formal to non-formal education, and across the continuum of ECCE through to tertiary and adult education and learning. Figure 2.3 (in Section 2.6) shows how the Curriculum Framework relates to the life course.

2.6 Curriculum Framework mapping: overview

Chapters 3-19 describe how education across all levels can shape learning outcomes, applying the competencies-based methodology outlined in Section 2.3.

Each SDG is broken down to illustrate how this systematic methodology can be applied at all levels of education and across all SDGs for the development of engaged global citizens, driven to support the achievement of the SDGs.

The matrices presented in Chapters 3-19 (see Figure 2.3 for the template) are by no means exhaustive, nor are they a checklist. They are guides rather than blueprints. Similarly, the overall framework represents a flexible tool that can be tailored for the review, audit or development of national curricula. The exact scope and content will depend on the context and the identified needs of each country.

Figure 2.3 Matrix used for the mapping of the Curriculum Framework

Goal [insert number] – [insert title] (e.g. Goal 13 – Climate Action)

[Insert SDG description] (e.g. Protect the Planet – Take urgent action to combat climate change and its impacts)

		Knowledge & Understanding	Skills & Applications	Values & Attitudes
Life course	ECCE	*	*	*
	Primary Education	*	*	*
	Secondary Education	*	*	*
	TVET	*	*	*
	Tertiary Education	*	*	*
	Adult Education	*	*	*

3. Goal 1 – No Poverty

End poverty in all its forms everywhere

'Poverty is hunger. Poverty is lack of shelter. Poverty is unclean drinking water. Poverty is being sick and not being able to see a doctor, being illiterate and not being able to go to school, being unskilled and not being able to find a job. Poverty means fear for the future, living one day at a time. Poverty makes people feel powerless, unable to affect their own lives let alone the powers that govern them. Poverty is a situation people want to escape.'

(World Bank 2005)

Until recently, poverty was understood largely in terms of income – or a lack of one. To be poor meant that one could not afford the cost of providing a proper diet or home. However, poverty is about more than a shortfall in income or calorie intake. Amartya Sen (2001), winner of the Nobel Prize for Economics and whose work inspired the United Nations Development Programme (UNDP) Human Development Reports, argues that poverty

should be understood as lack of substantive freedoms – the capabilities to choose a life one has reason to value. The UNDP Human Development Report (UNDP 1997) refers to poverty as 'the denial of opportunities and choices most basic to human development – to lead a long, healthy, creative life and to enjoy a decent standard of living, freedom, dignity, self-esteem and the respect of others'.

Poverty severely reduces people's choices in life. In extreme cases, they may have to spend much of their time focusing on finding enough food or fuel for their families to survive and may not be able to afford school for their children. Even those living in relative poverty are likely to be excluded from fully participating in society. Relative poverty occurs when poor people in a 'rich' country live above the global extreme poverty threshold but still fall well below what that country would define as a reasonable standard of living.

Extreme poverty is a challenge that faces people in many less economically developed countries. In 1990, the World Bank set the extreme poverty rate as living at or below US\$1.00 a day; that threshold has since been updated to US\$1.90 per person per day to reflect the minimum consumption and income level needed to meet a person's basic needs (Ferreira et al. 2015). In other words, people who fall under that poverty line, i.e. about 800 million people, lack the ability to fulfil basic needs, whether it means eating only one bowl of rice a day or foregoing healthcare when it is needed most.

Universal Declaration of Human Rights, Article 25

'Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control.'

(UN 1948)

Education and poverty are inversely related. Populations with high education levels have a lower number of people in poverty, as education imparts knowledge and skills that garner higher wages. The direct effect of education on poverty reduction is through increased earnings or income. The indirect effect of education on poverty is that education improves income, and thus makes the fulfilment of basic necessities easier and raises living standards, reducing human poverty. Education indirectly helps in the fulfilment of basic needs such as water and sanitation, utilisation of health facilities and shelter, and also affects women's behaviour towards reproductive health and family planning (Jeffery and Basu 1996). Conversely, poverty is a barrier

to education. According to the United Nations Educational, Scientific and Cultural Organization (UNESCO 2016), a study of 20- to 24-year-olds across 101 low- and middle-income countries found that, on average, the poorest have five years fewer schooling than the richest.

Human capital is required for the effective utilisation of physical and natural capital, and technology and skills. Growing disparities need to be addressed, as the gap between the richest and poorest continues to grow. It is thus becoming increasingly difficult for marginalised and vulnerable groups to pull themselves out of poverty. The 'feminisation of poverty', for example, sees women becoming more deprived and facing more severe hardships in pulling themselves out of poverty, compared with men, because of unequal educational and employment opportunities. Equal educational opportunities are required if poverty is to be eradicated. The longer children live in poverty, the lower their educational achievement and the worse their social and emotional functioning (Duncan et al. 1994). Children living in childhood poverty are exposed not only to more psychosocial stressors but also to more impoverished physical living conditions (Evans and English 2002).

Education that is not relevant to future prospects and employability results in lack of knowledge of future career paths, poor marks in exams and absence from school. The curriculum has clear implications for children's enrolment and dropout rates as well as educational attainment.

Expanded education opportunities that ensure equality and equitable access to quality education and learning, and that reach the most disadvantaged groups, will break the intergenerational transmission of poverty. These opportunities will also build resilience to adverse shocks and improve income security, and move people out of poverty (Vladimirova and Le Blanc 2015). Similarly, availability of different forms of education and flexibility of educational systems will retain children and young people in learning environments. Formal schooling may not hold any practical application for disadvantaged children and young people, and may not help them break the cycle of poverty or maximise their potential. When dealing with very poor households, especially those in which children are most likely to share responsibility for household duties or family income, the fact that they have to work to meet their basic needs must be considered given the possible conflict between children's need to survive economically and their right to an education.

Moreover, educational disadvantage is likely to be transmitted to the next generation, with the children of low-skilled parents and families more vulnerable to low educational attainment. A workforce with low or limited skill levels, poor educational attainment and limited aspirations reduces productivity, economic growth and a country's capacity to compete in the global economy.

	Knowledge and understanding	Skills and applications	Values and attitudes
ECCE	<ul style="list-style-type: none"> Awareness of self and others, of differences, and of the world around them, through experiential and exploratory learning. Describe preschool/nursery and associated experiences. 	<ul style="list-style-type: none"> Engagement in activities to foster skills and abilities development, including through exploration and problem solving, the asking and answering of questions, and interaction with classmates and adults. 	<ul style="list-style-type: none"> Promotion/development of empathy, generosity and sharing, interest in engaging with others, and emotional well-being.
Primary education	<ul style="list-style-type: none"> Explore the complex issues of poverty to understand the interconnected world we live in. Concept of poverty, from an individual understanding within local context to a global perspective examining the extent of poverty in Commonwealth countries. Differences in economic, demographic and social characteristics between countries across the world. Causes of global poverty and inequality. Conditions of poverty due to lack of food, poor sanitation and other losses of services. Learning about the different concepts of poverty, and what life is like for people living in poverty. 	<ul style="list-style-type: none"> Application of critical thinking for analysis of poverty and related issues through simulations, discussions, challenging assumptions, developing supporting arguments, and sharing and evaluating information, experiences and opinions. Learning supported by teamwork and co-operation, discussion and reflection, and the application of different methods (e.g. statistical analysis and persuasive writing) to examine and interpret poverty in the world around them. Understand the possibility of change and develop actions that support this change. Development of basic financial literacy skills. 	<ul style="list-style-type: none"> Awareness of the multiple causes of poverty. Qualities of empathy and understanding, sensitivity to the issues of poverty and inequalities, identification of personal biases regarding poverty, and acceptance of differences. Recognise people's common humanity and what can be learnt from others. Willingness to explore solutions and confidence that extreme poverty can be overcome in the learner's own lifetime. Action-oriented in furthering awareness. Placing value on education and financial management.
Secondary education	<ul style="list-style-type: none"> Introduction of concepts such as sustainable development, equity and scarcity, links to resources, livelihoods and gender interconnections with resources. Understanding of poverty and the complex reasons it exists, and of how living standards differ, and strategies for poverty alleviation (including examination of case studies and use of statistics). Furthering of financial understanding, including managing finances and budgetary planning, and the financial landscape. Calculating what US\$1.90 a day can buy in different countries; exploring concepts of relative and absolute/extreme poverty. Household poverty dynamics. Social structures and effects of economic and business trends on the family. 	<ul style="list-style-type: none"> Application of concepts to the real world, making connections between issues, understanding of the consequences and developing practical solutions (e.g. through collaborative and investigatory activities). Research and evaluate issues and dynamics related to poverty and economics. Application of financial literacy, such as the ability to put theory into practice (e.g. financial planning, implementation and evaluation). Understand the relationship between poverty and sweatshops and child labour. Understand the scope/degree of poverty and the impacts of extreme poverty on children around the world. Understand the impact of availability or scarcity of resources on family and community life. 	<ul style="list-style-type: none"> Commitment to eradication of poverty, and willingness to work towards a more equitable future. Awareness of diversity within all groups in all societies, and capacity to challenge stereotypes. Commitment to and self-confidence in the ability to create change. Sense of social justice and social responsibility. Sense of financial responsibility. Raise awareness and participate in community engagement e.g. developing poverty awareness campaign. Empathy and a sense of social justice.

	Knowledge and understanding	Skills and applications	Values and attitudes
TVE	<ul style="list-style-type: none"> • Knowledge of different poverty alleviation and eradication strategies. • Training for livelihood improvement and poverty reduction, including access to decent work (including informal sectors and non-traditional areas). • Training to access decent jobs and support smallholder market and inclusive business models. • Micro-finance and youth learning. • Training in non-agricultural occupations and non-traditional areas to respond to labour market demand. • Sustainable economic enterprises. • Training for workers in the informal sector (including small and micro-enterprises) for livelihood improvement and poverty reduction. • Developing an understanding of economic sustainability. • Understanding of pro-poor and gender-sensitive development strategies, social protection systems and measures. • Knowledge of skills and competencies required to succeed in work. 	<ul style="list-style-type: none"> • Ability to plan, implement and evaluate economic and social empowerment strategies and endeavours. • Development of communication and negotiation skills for social development and financial application. • Development and application of skills and aptitudes that allow engagement, adaptability and resilience within changing labour markets and economies. • Ability to act on opportunities and have an understanding of how these initiatives can meet social and economic needs in the community. • Demonstrate the basic skills and behaviours of entrepreneurship – risk, initiative, organisation, confidence, communication and collaboration. 	<ul style="list-style-type: none"> • Productive participation in society. • Self-assessment of personal values in choosing work, considering livelihood generation in relation to personal, community and societal needs. • Considers benefits and drawbacks of different choices. • Proactive. • Contribute to a human resource base that supports poverty reduction and inclusive growth.
Tertiary education	<ul style="list-style-type: none"> • Complex understanding of the relationship between poverty, economics, power, conflict, inequality and other environmental, social and economic issues. • Research on global development and current societal need to identify skills demand in priority industries. • In-depth research on poverty alleviation and sustainable development, locally and globally. • Financial education to improve micro-finance projects. • Research the relationships between poverty, vulnerability and other stressors that are impacted further by climate change. 	<ul style="list-style-type: none"> • Complex financial and economic skills. • Skills to support development co-operation activities. • Ability to explain the relationship between poverty and other economic, social and environmental shocks and disasters. • Application of data collection and analysis skills to develop strategies for poverty alleviation (e.g. report on consequences of poverty). • Identify methods for mitigation and resilience. • Ability to participate in debates related to poverty. 	<ul style="list-style-type: none"> • Concern for social justice. • Pro-poor awareness. • Willingness to engage in social, economic and political inclusion of all groups (including vulnerable populations, disadvantaged groups and migrant workers). • Motivated to influence decision making related to poverty eradication, and participation in pro-poor development and poverty eradication activities.
Adult education	<ul style="list-style-type: none"> • Basic financial skills using a variety of delivery methods, including mass media and radio programmes. • Smallholder-market inclusive business models, and financing options and availability. • Micro-finance to indirectly support education by providing families with income stability, enabling them to afford schooling and break the poverty cycle. 	<ul style="list-style-type: none"> • Build resilience in vulnerable situations, and gain financial stability through diverse income-generating activities. • Engage in development co-operation with agencies in communities. • Ability to access resources, services and markets to reduce poverty and improve quality of life. • Application of financial management and budgeting skills. 	<ul style="list-style-type: none"> • Self-confidence to engage in inclusive business models. • Pursuit of financial security and resilience, dignified livelihoods and adequate standards of living. • Exercise rights to economic resources, access to basic services, ownership and control over land and other resources, technology and financial services.

4. Goal 2 – Zero Hunger

End hunger, achieve food security and improved nutrition and promote sustainable agriculture

The education sector contributes to food security through several components, including 1) food availability (e.g. through growing produce in school gardens); 2) proper use of food (e.g. sanitation, hygiene, and nutrition education); and 3) as a safety net, as the provision of school meals helps to keep children in school and thus helps families to educate their children and protect their food security in times of crisis (World Food Programme 2016). School meals support children's development so that they become healthy and productive adults, breaking cycles of hunger and poverty. Education and food security interact in multiple, mutually reinforcing ways. For instance, food security improves learning outcomes by resulting in better cognitive function and increased school attendance.

'The fact that hunger, illiteracy and lack of schooling affect many of the same areas and people is no coincidence. Hunger, malnutrition and food insecurity erode cognitive abilities and reduce school attendance. Conversely, illiteracy and lack of education reduce earning capacity and contribute directly to hunger and poverty.'

- FAO 2004

As stated by the United States Agency for International Development, 'designing food security and education programs with an explicit recognition of these positive linkages can benefit both sectors and contribute directly to the achievement of Millennium Development Goals 1 [eradicate extreme hunger and poverty] and 2 [achieve universal primary education]' (2011), both of which have commonalities with SDG 2. People who are well nourished live, learn and work longer, and contribute to achieving their

societies' aspirations for inclusive economic growth, human development, environmental health and innovation. All 17 SDGs are very much interconnected. Ties between SDG 1 (end poverty) and SDG 2 (end hunger) are particularly strong. However, agriculture faces multiple challenges: a world population expected to grow to 9 billion by 2050, a smaller rural labour force, soil quality degradation, climate change, food wastage, water scarcity, biofuel production and changing lifestyles leading to urbanisation and more protein-intensive diets. Furthermore, agricultural productivity increases would ensure food security for everyone only if access to safe, nutritious, sufficient and environmentally sustainable food is secured.

Education plays a key role in helping people move towards more sustainable farming methods, promoting sustainable smallholder agriculture and understanding of nutrition. Investing in agricultural education and training is essential. This includes rural agricultural development through agricultural colleges and universities (teaching, research and outreach) at all levels, for farmers, extension service providers, researchers, etc. to develop a knowledge system and support network, and upgrading the skills and capacities of individuals involved in all aspects of agricultural innovation.

For example, a mother's education improves her children's nutrition, especially as she seeks higher levels of education. Greater income from a mother's employment translates into higher consumption of market-purchased inputs such as food and medical care that raise nutritional status (Glick 2002).

Educated parents demonstrate responsibility for the nutritional well-being of children and adolescents, and understand the use of pesticides or hormones in food. Promoting nutrition through schools can create benefits that extend beyond the classroom and playground to improve the health and nutritional well-being of households and communities.

In many countries, nutritional disorders primarily related to an unhealthy diet and lack of physical activity are a challenge. Schools reach children at an age when food and health habits are being formed; they also reach families. Consequently, the school community can be a channel for wider community participation.

A report published by the CGIAR Research Program on Climate Change, Agriculture and Food Security, the Pacific Community, WorldFish and the Technical Centre for Agricultural and Rural Cooperation highlights major threats facing the region's food security, along with potential opportunities (Bell et al. 2016). *Climate Change and Pacific Island Food Systems* (Bell et al. 2016) examines four possible development pathways to test and guide policy making to enhance resilience and strengthen adaptation to climate change among fishing communities and farmers in the Pacific region. The report (Bell et al. 2016) makes three main recommendations for responding to climate change in the Pacific:

1. conduct national assessments of the vulnerability of agriculture in Pacific Island countries and territories to climate change and identify, for example, the implications for food security and livelihoods from projected changes in production, population and urbanisation;
2. identify research to be done in each country to implement priority adaptations based on, for example, projected food needs of rural and urban populations and existing production methods and capacity, including traditional knowledge; and,
3. strengthen food systems research for the region, for example, by creating effective partnerships between national research and extension agencies, farmers' networks, NGOs and scientific institutions to improve national capacity to carry out research, and by providing farmers and fishing communities with climate services to guide their investments and activities.

Growing pressure on global food systems constitutes a critical development challenge and presents an increasing risk for businesses, governments, communities and the environment. Knowledge and training are required to increase productivity, build resilience and strengthen the smallholders' ability to influence decisions that have a direct impact on their lives. Research and training on the sustainable use of genetic diversity in the agriculture sector are also key to designing and delivering effective, scalable and practical solutions for secure and sustainable food and agriculture systems. The workforce needs training and capacity building to eradicate hunger and improve food and agriculture systems, as well as to implement sustainable practices and work in partnership with other actors throughout the agricultural value chain (including input, production, distribution and retail). In particular, empowering small farmers, increasing agricultural productivity and farmers' livelihoods, raising consumers' awareness and increasing agricultural investment, as well as knowledge sharing, will be necessary for better functioning food and agriculture systems.

	Knowledge and understanding	Skills and applications	Values and attitudes
ECCE	<ul style="list-style-type: none"> Learn about food through healthy meals and snacks. Tastes and textures of different foods. Connect the learning environment with food, farming and the national environment. 	<ul style="list-style-type: none"> Ability to identify different foods. Ability to communicate food preferences and express opinions on food. Ability to identify healthier food options such as fruits and vegetables. 	<ul style="list-style-type: none"> Positive attitudes and skills for healthy habits beyond school and into adulthood. Make healthier choices and serve as role models within schools and communities later in life.
Primary education	<ul style="list-style-type: none"> Nutrition education that combines classroom learning with practical learning activities (e.g. growing fruits and vegetables in school gardens, preparing food, planning meals, practicing personal hygiene, improving school meals and keeping a clean, safe school environment). Gardening activities, combined with eating the foods produced and learning about healthy dietary practices. Defining hunger and malnutrition. Explore the definition and problems of hunger, malnutrition and food insecurity. Food security, livelihood and gender inequality. Where different foods come from: fruits, vegetables, dairy, meat. Follow food from the farm to the pot. Storing food: fresh, tinned, dried, frozen. 	<ul style="list-style-type: none"> Distinguish between food groups and types of food to eat, and why, and establish a balanced diet. Create mindful eating plan and commit to making changes in personal eating and buying habits. Ability to read labels and ingredient lists, and how to interpret health claims. Identify and access healthy alternatives to fast food. Apply healthy eating concepts to avoid food-related illnesses e.g. obesity or diabetes, including ability to distinguish between portion and serving size. 	<ul style="list-style-type: none"> Adopt healthy lifestyles and mindful eating habits beyond school and into adulthood. Willingness to find solutions to food insecurity and malnutrition. Appreciate indigenous or local perspectives on ways of living together and using resources sustainably. See every individual as a powerful agent of change to sustain the food system. Share learning with friends, family and community. Positive attitudes and skills that pave the way for carrying healthy habits beyond school and into adulthood. Taking responsibility for personal health.
Secondary education	<ul style="list-style-type: none"> Food and nutrition sciences to identify the ways in which physical factors influence food choices (e.g. geographical location, regional growing seasons, availability of food markets, home storage capacity). Understand and calculate nutrition requirements depending on age, activity levels and health. Influence of geography on food supply and production. Different dimensions of global hunger (definition, measurement, who is at risk, causes and solutions). Integrate relevant aspects of indigenous knowledge and approaches to teaching and learning into the school curriculum. 	<ul style="list-style-type: none"> Understand the reasons why people eat the foods they eat (cultural, emotional, environmental, nutritional, religious, social, etc.) Analyse and display the energy value of different food types using charts and graphs, and consider when planning meals. Ability to engage in food literacy campaigns in learning environments and communities, to encourage wellness, cooking, gardening or physical fitness. Plan menus and select and prepare foods, taking into consideration economic, geographical and seasonal factors that affect the availability of ingredients. Ability to develop a social action plan around an issue concerning food politics and apply the basics of social advocacy and self-empowerment. 	<ul style="list-style-type: none"> Demonstrate commitment to challenging and transforming assumptions and behaviours connected to health and wellness. Challenge and change embedded behaviours and beliefs about food and its role in daily lives. Engage in good dietary practices. Conscientious citizens that reduce food waste and loss. Increased awareness of hunger-related problems and ability to generate multiple solutions for addressing problems. Appreciate the role of indigenous knowledge and traditional ways of learning in maintaining the sustainability of a community. Poverty and hunger awareness, and empathy. Take action in local communities, and as global citizens.

	Knowledge and understanding	Skills and applications	Values and attitudes
TVET	<ul style="list-style-type: none"> Entrepreneurial and business skills courses to improve agricultural practices. TVET programmes on sustainable food systems that include environment, people, inputs, processes, infrastructures, institutions, etc., and activities that relate to the production, processing, distribution, preparation and consumption of food. Supply chain food safety management systems. Nutrition, crop diversification and farm management. Farm forestry; non-wood forest products and links with farming; artisanal food production; food tourism. 	<ul style="list-style-type: none"> Conducting a community audit to identify hunger and possibilities for food security and food gardens. Rural youth appreciate and enter a broader range of new technical areas such as farm management, agribusiness development, value addition and marketing. Understand and measure the income opportunity of a farm food business in added value food production and/or food tourism. Awareness of the cost issues of animal treatment, husbandry and feed alternatives. 	<ul style="list-style-type: none"> Promote best practice to ensure food safety in agriculture sector, food processing industries, food distribution system and in food value chains. Supervisors and managers appreciate nutritional needs of the workforce and ensure improved access to food at work through canteens and meal subsidies. Adaptive capacity among small-scale farmers. Motivated to become successful rural entrepreneurs. Appreciate artisan food production and food tourism as complementary to farming, adding value to entrepreneurial diversification and innovation.
Tertiary education	<ul style="list-style-type: none"> Research on food security and basic nutritional and calorie requirements for human populations. New areas of training in agriculture and food supply: environment and natural resource management, biotechnology, farming systems management and agribusiness. Conservation agriculture and agroforestry for enhancing food production in an ecologically sustainable fashion, and for providing mechanisms to expand and diversify livelihood options. Research on how to optimise conservation agriculture practices, including agroforestry and farmer-managed natural tree regeneration, conservation tillage, contouring and terracing, and mulching for strengthening ecological and social resilience. Impact of climate change on food security (production, access, availability, including transport, processing, storage, marketing and consumption). Climate change, energy, agriculture and food security nexus, within the context of sustaining and enhancing ecosystem services and agrobiodiversity. 	<ul style="list-style-type: none"> Building socio-economic resilience of communities through climate-smart agriculture. Ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production. Ability to consider the relationships between nutrition, lifestyle, health and disease, and take appropriate measures. Understanding of diversity, interdependence and global connections that are critical to achieving and maintaining food security and eliminating hunger. Develop policies for the food and agriculture sectors (both agriculture and fisheries) and welfare policies. Adoption of sustainable land use practices. Understanding of potential interactions between climate change and other key drivers of food prices that act at national, regional, and global scales, and how these can be moderated. Generate human capital for research and advisory services. 	<ul style="list-style-type: none"> Commitment to developing national policies and mainstreaming of food security concerns and awareness, at all levels. Adopt transformational change in agriculture and food systems to address environmental, social and economic challenges, and contribute to social equity and environmental stewardship in contexts of natural resource scarcity. Protect, promote and monitor rights and non-discrimination: right to adequate food and to be able to feed oneself in dignity, and all other related rights employment, land and water rights, with a focus on marginalised groups, poor households, children and women. Resilient to climate change impacts on food security including on livestock, fisheries and aquaculture. Respect for traditional medicine and indigenous knowledge systems. Enhanced producers' capacities for innovation, and generating human capital for research and advisory services.

Adult education	Knowledge and understanding	Skills and applications	Values and attitudes
<ul style="list-style-type: none"> • Education and training for all those involved in providing school foods and school feeding programmes. • Parent wellness programme. • Agricultural education and training for local community groups, especially women and girls, to raise agricultural productivity. • Traditional knowledge on sustainable agrosystems and farming through informal community learning networks. • Advanced levels of education for farmers to make use of new information and communications technology (ICT)-based information sources and technical advice, and to respond to new market opportunities and environmental change. • Overview of the social, political and economic forces that shape what we eat, and strategies for improving health. • Training in women's leadership in economic organisations. • Land rights and ownership. • Nutrition and vegetable gardening combined with accounting and group management for female vegetable farmers. • Adult farmer training programmes including husbandry. • Livelihood programmes for women. • Health–wealth connection and the role of government subsidies and policies. • Complexity of agroecological systems. 	<ul style="list-style-type: none"> • Ability to implement sustainable agriculture practices. • Application of knowledge to ensure good farm planning and techniques (including livestock) and tree management (mixed farming, organic farming, resistant crops). • Understand entitlements to own and control productive resources and assets. • Understand the market viability of artisanal food production and the impact such food production would have on a farm income. • Farmers understand crop rotation and can ensure food crop productivity and balance with cash crops. 	<ul style="list-style-type: none"> • Improved food and water hygiene. • Improved nutrition for vulnerable groups. • Serve as role models and become agents of change. • Recognise the essential role of farmers in maintaining biodiversity and providing environmental services, as well as producing food and fibre. • Exercise secure and equal access to land, other productive resources and inputs. Access to knowledge, financial services, markets and opportunities for value addition and non-farm employment. • Practice resilient agricultural practices that help maintain ecosystems, strengthen capacity for adaptation to climate change and disasters (especially drought and flooding), and progressively improve land and soil quality. • Women empowered to access agriculture extension services, resources and services. • Engage to increase secure livelihoods. • Motivated small-scale food producers who work towards agricultural productivity and increasing incomes. 	

5. Goal 3 – Good Health and Well-being

Ensure healthy lives and promote well-being for all at all ages

The beneficial effects of both education and health on individual life opportunities and societal advantages are widely known. However, there also exists a strong mutually reinforcing relationship between education and health, with improvement in one having clear positive impacts on the other.

A country's wellness and standard of living is measured by how well it succeeds in developing and utilising the skills and knowledge of its population, by furthering the health of the majority of its population and by educating them. Learning environments can foster academic, social and life skills that are critical to healthy transitions. Schools and other learning environments can disseminate information about health through:

- school health policies (including regulations and practices that influence healthy choices such as the availability of healthy foods, smoke- and drug-free environments, and emergency plans);
- indoor and outdoor activities (including use of sports equipment); and
- health and life skills programmes.

Schools and learning environments that promote health can positively influence learners' knowledge of and attitudes towards a range of health and social issues, and can be one of the most cost-effective investments, improving not only health but also educational outcomes. School health programmes are tools to mitigate health risks among youth and to engage the education sector in efforts to change the educational, social, economic and political conditions that affect risk.

Why does health benefit education?

Poor health can affect education by impeding both motivation and ability to learn through:

- impaired sensory perceptions caused by ill health (for example, visual impairment);
- poor cognition;
- low levels of physical energy;

- altered treatment within classroom or discrimination by peers due to health condition;
- low self-esteem;
- reduced connectedness and engagement with school; and
- absenteeism and dropping out.

There is a negative cycle of health and education where poor school performance predicts physical, mental and emotional problems, and health-harming behaviours. Poor health and harmful behaviours in turn compromise school performance. Conversely, good physical and mental health improve educational outcomes.

The existence of a strong association between social class and health is well established (Marmot 2010), as are the differences in educational achievement between the rich and poor. Health disparities and the educational achievement gap often affect the same people and are likely to share many of the same socio-environmental factors. These include familial, social, environmental and economic factors, and their effects continue throughout the life course. Evidence now suggests that health may be the causal mechanism through which socio-economic status affects educational achievement (Koivusilta et al. 2003; Basch 2011), and addressing health disparities is likely to have positive impacts on the achievement gap.

Why does education benefit health?

Education and learning settings offer huge benefits to health by providing an opportunity for a universal approach to improving health and well-being. The Health Promotion component of the Health Systems Policy Framework for the Commonwealth provides a meaningful setting within which to consider these benefits. The framework identifies four key components of health promotion, which move gradually outwards from a focus on the individual to an inclusion of the wider determinants of health: behaviour and health literacy, resilience, social and economic determinants, and environmental determinants. The framework also

highlights two further elements that have influence across each of these components: (1) the need to take a life course perspective, and (2) the need to address health inequalities. Although both have relevance across all four components, the relative importance of each differs, with a greater emphasis on the life course perspective where the individual is the focus of health promotion, and a greater emphasis on addressing inequalities when wider determinants are considered.

Life course approach to neurological development

It is increasingly recognised that the experiences of individuals throughout their life course have a cumulative impact on their health and well-being in later life. The experiences that have impact are considered to be very broad and include the social, cultural and economic environment, as well as any experiences specific to the individual. The focus has usually been on the impact of negative experiences, and those in the early years of life and childhood are particularly important.

Adverse childhood experiences such as abuse and trauma are among the experiences that cause chronic stress. Furthermore, the timing of the stress is now known to be important, with impacts on different parts of the brain depending on what areas are developing at that time. This will have

implications for understanding both the vulnerability of the individual at different times in their life, and also on the potential impact of interventions intended to mitigate these effects at different stages of education.

Behaviour and health literacy

Education environments offer an opportunity to teach basic knowledge and skills that promote health and safety such as:

- avoiding substance misuse (including alcohol, drugs and tobacco);
- healthy eating;
- sexual health; and
- physical activity.

Environmental determinants

The health and well-being of individuals and populations is affected by several wider environmental determinants such as sustainability, climate change and biodiversity. Education settings provide an opportunity to address these determinants of health by incorporating learning about the relevant risks and responsibilities that will facilitate and empower individual and community action to promote these.

The health impacts of violence and other adverse childhood experiences are substantial and include:

- poor mental health:
 - depression, anxiety, post-traumatic stress disorder (PTSD), suicidal ideation and actual attempts, substance misuse;
- an increase in behaviours harmful to health:
 - smoking, alcohol consumption, risky sexual behaviour, injecting drug use;
- chronic disease in adult life:
 - lung cancer and other lung diseases, cardiovascular disease, obesity, autoimmune disease;
- poor social outcomes:
 - offending, poor educational attainment;
- impaired cognition, learning and memory:
 - intellectual development delays, language and psychomotor deficiencies, memory impairments.

Life stage	Brain regions affected by stress and the likely effects
Prenatal period	Many brain regions are affected by maternal stress during this time, including the hippocampus, frontal cortex and amygdala. Effects will therefore be broad and include shaping of the baby's own stress response system, subsequent behaviour such as unsociable behaviour, attention deficit hyperactivity disorder (ADHD), drug abuse and mood and anxiety disorders, and learning, memory and cognition.
Early childhood	Hippocampal development is affected, resulting in later mental health problems and impaired learning and cognition.
Adolescence	Frontal cortex development is affected, which can result in difficulties controlling emotions and cognitive processes. This may be why mental health problems tend to emerge at this time. Adolescents are also particularly vulnerable to risk-taking and harmful behaviour at this time, as there is a rapid rise in dopamine activity, which encourages reward-seeking behaviour that the impaired frontal cortex may not manage to control.
Adulthood and aging	The hippocampus is undergoing the most rapid decline in response to stress, which can contribute to memory and cognition problems such as Alzheimer's disease.

Life stage	Potential interventions appropriate for life stage
Prenatal/pregnancy	Stress reduction, resilience
Early childhood	Interaction with adults, understanding emotions
Childhood	Social and emotional skills, calming down
Adolescence	Managing emotions, violence and conflict management
Adulthood	Stress management at work
Older age	Cognitive exercises

Education settings also provide an opportunity to promote health and well-being through interventions that develop resilience. This can be particularly effective in addressing health inequalities, as vulnerable or susceptible individuals such as those whose neurological development has been affected by adverse childhood experiences may benefit most from intervention (Bowes and Jaffee 2013). It seems therefore that individuals who are most susceptible to the harms to health of negative experiences are those most helped by interventions to promote resilience.

Health protection

Health protection is a term used to encompass activities that ensure robust health security at local, national and global level. These activities aim to protect the public from avoidable health risks and minimise impacts on health where exposures cannot be avoided. This includes the establishment and strengthening of services and systems that cover:

- communicable disease control;
- emergency preparedness and response;
- environmental health; and
- climate change and sustainability adaptation and mitigation.

Health protection is co-ordinated at global level through the International Health Regulations. It includes strengthening wider health systems such as governance, knowledge, advocacy and capacity, and incorporates the roles of mainstream health systems in prevention and early detection and treatment of disease, via people-oriented services that work with other sectors outside health to promote health and well-being in all services.

Education is a valuable mechanism to equip the health workforce with the knowledge, skills, and values and attitudes to develop effective health systems and activities that ensure strong health security.

	Knowledge and understanding	Skills and applications	Values and attitudes
ECCE	<ul style="list-style-type: none"> Basic learning on personal hygiene and well-being, including exercise and healthy eating. Fun and play as a context for learning. Basic emergency preparedness and evacuation drills, and learning to be safe. Signs and symptoms of poverty, undernutrition, unhealthy environments, deprivations and trauma. 	<ul style="list-style-type: none"> Developing life skills for resilient individuals, and bullying prevention. Basic hygiene and food handling practices. Motor skills development to set a platform for lifelong physical activity. Ability to stay safe in emergencies. Begin to develop socio-emotional literacy (manage feelings, build relationships, understanding others' emotions). 	<ul style="list-style-type: none"> Self-confidence and self-awareness. Healthy hygiene and nutritional habits. Positive relationships with peers and adults using social and emotional cues. Ability to act autonomously, identify opportunities and pursue these to meet goals. Appreciation of play, movement and active recreation.
Primary education	<ul style="list-style-type: none"> Learning to address personal and food hygiene and sanitation, and disease and infection transmission/control. Understanding healthy eating and nutrition. Engage in various activities for health, fun, and development of motor skills. Physical literacy to establish a basis for lifelong physical activity and active living. Learning about pressures and harmful behaviours, and ways to resist them. Emergency preparedness, evacuation drills, first aid. Pedestrian and cycling safety. Basic understanding of physical and mental health conditions and disabilities, risk factors, etc., including non-communicable diseases. Antiviolence and bullying prevention. Learning about mental and emotional health, and sexual and reproductive health and rights. 	<ul style="list-style-type: none"> Application of understanding to real life, such as personal hygiene and sanitation, and healthy living (e.g. food choices and exercise). Ability to communicate healthy living practices to family and community. Ability to access information for informed decision making and application for positive and healthy behaviours (e.g. in relation to sexual and reproductive health, food and hygiene choices, participation in sport). Ability to identify positive and negative influences, analyse risks, and make informed decisions. Coping, social and cognitive skills in managing personal health and well-being. Ability to express feelings in a healthy way, use self-control and impulse control, manage emotional and physical stress, and seek assistance if necessary. 	<ul style="list-style-type: none"> Responsibility for personal health and well-being, placing value on personal hygiene and sanitation, good nutrition, physical activity, and reducing risks to physical and mental health. Establishment of positive eating and fitness habits. Empowerment to take action and recognising the ability to promote understanding and healthy practices to others. Positive attitudes toward self, and acceptance of responsibility for personal sexuality. Independent decision making that analyses health and well-being influences and risks, and respects human rights (e.g. resisting peer pressure in bullying). Tolerance, respect and understanding of others' differences and emotions.
Secondary education	<ul style="list-style-type: none"> Health education, such as determinants of health and communicable and non-communicable diseases, and links between quality of nutritional intake, environmental factors and lifestyle choices. Understanding of factors, interrelationships and risks that affect health, exploring links to wealth, immunisation levels, education, environmental factors, etc. Understanding of differences across the globe (e.g. life expectancy), and introduction of complexities that influence these. Understanding of the principles that underlie personal and social well-being. Principles of first aid. 	<ul style="list-style-type: none"> Ability to apply knowledge, and practice responsible and informed decision making about social, health and sexual behaviour, including negotiation of safe sex and healthy relationships. Apply research and evaluation skills to critically analyse factors affecting health and disparities. Identify and evaluate risks. Resilience skills to deter behaviours and lifestyles associated with crime, drugs, violence, motor vehicle accidents and other injuries. Ability to access health information and services. Mental health awareness and ability to recognise issues and build resilience. Analyse the influences that impact on personal development (media, peers, family, etc.). First aid skills. 	<ul style="list-style-type: none"> Appreciation for health and well-being, and understanding that health is a state of physical, emotional, social, and mental well-being. Responsibility for personal health and well-being, and for choices and behaviours, and respect for the choices and circumstances of others. Recognise risks to mental/emotional well-being. Value physical activity. Importance of healthy relationships. Use of adverse experiences for personal growth and development. Show tolerance and acceptance of differences in others, including countries' differing access to economic and geographic resources.

	Knowledge and understanding	Skills and applications	Values and attitudes
TVET	<ul style="list-style-type: none"> Understanding of food chain and hygiene (e.g. foodborne illnesses). Knowledge of global challenges in relation to health and well-being, disease prevention and curative measures, and balancing financing between preventative and curative healthcare and holistic methods for addressing these challenges. Develop an understanding of successful population health interventions and insights on health concerns and issues, priorities and strategies to support practice for health practitioners, and planning and delivery of public health. 	<ul style="list-style-type: none"> Identify ways of preventing contamination at the industry and household levels. First aid skills. Ability to devise and implement strategies for prevention and disease promotion, and allocate funding appropriately. Ability to apply and adapt knowledge of health situations in other contexts to own context, and to analyse and present data. Ability to undertake health-sector planning using good governance, evidence-based policy making and careful consideration of implementation. 	<ul style="list-style-type: none"> Place importance on need for disease prevention in practice and do not solely focus on curative measures. Value the sharing of best practice and use of proven methods in addressing health challenges. Health professionals who value the need for devising efficient, equitable and cost-effective health systems that improve quality of life for all. Voluntary and community groups develop potential to support vulnerable and isolated people and promote community participation. Delivery of public health for all. Promote community responsibility for ensuring healthy environments.
Tertiary education	<ul style="list-style-type: none"> Training in surge capacity for emergency response and preparedness. Development of expertise and research in health-related issues and policies. Knowledge of signs of physical and emotional abuse and child abuse. Understanding of complex links between health, vulnerabilities and environmental factors (e.g. climate change). Understanding of social determinants of health and social environments affecting health and well-being, and of how behaviours are shaped/constrained by contexts. Understanding of the link between physical activity in childhood and adolescence, and lifelong physical activity and active living. 	<ul style="list-style-type: none"> Ability to rapidly respond to health emergencies. Skills to work collaboratively and effectively in interprofessional teams and with knowledge on social determinants of health and public health. Promotion in attitudes and skills with reductions in risk behaviours. Capacity for healthcare innovation and biomedical research. Ability to use sport as a tool to contribute to broader development outcomes. Research to support improved health and well-being (e.g. access to safe water), and strengthening research initiatives. Applied knowledge and understanding to promote active living (e.g. design, implement and evaluate inclusive physical activity). 	<ul style="list-style-type: none"> Understanding the health, social and economic benefits of sport and physical activity participation across the lifecycle. Motivated and empowered to deliver quality care that is appropriate and acceptable to the socio-cultural expectations of the population. Respect needs of vulnerable groups and eliminate discrimination (e.g. gender, HIV). Belief in quality healthcare for all. Public service ethics, professional values and social accountability attitudes requisite to deliver responsive and respectful care. Committed to people-centred health services. Commitment to inclusive physical education and activity, and regulation to promote inclusive and equitable participation.
Adult education	<ul style="list-style-type: none"> Basic health literacy. Understanding of mental health issues in the workplace, how these can be dealt with effectively to improve resilience, and how to address these. Knowledge of maternal, neonatal and child healthcare and measures to improve them, and signs of child abuse. Knowledge of positive parenting techniques to ensure the positive upbringing and home lives of the next generation. Education for community health workers. 	<ul style="list-style-type: none"> Stress management techniques that can be used in a variety of situations. Ability to interpret and analyse information and make well-informed health decisions. Awareness of constructive parenting techniques and strategies, and confidence and understanding in application. Application of basic medical assistance, health education and awareness. Active collaboration in production and quality of healthcare and services. 	<ul style="list-style-type: none"> Values the benefits of positive mental health and well-being, including in the workplace and in communities. Recognition of the role of parents and their long-term impact on the lives of children. Act as links between the community and health facilities. Sense of personal and community health ownership, resilience and self-reliance.

6. Goal 4 – Quality Education

Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

Equity and quality of education are issues across the Commonwealth, especially for children and young people from the lowest income bracket.

When it comes to inclusion, many students in Commonwealth countries struggle with reading, and risk leaving school without basic skills for work and life.

Achieving the necessary '3 Rs' – reading, writing and arithmetic skills – is especially difficult for disadvantaged groups including minorities, who often lose out on both fronts: lower performance and low socio-economic background. Approaches to overcoming these hurdles include strengthening ECCE, considering the language of instruction, strengthening teachers' professional development and providing relevant curricula. Measures to facilitate access to the labour market can also increase incentives to obtain a good education. Universal access to basic education is essential for ensuring that all segments of society will benefit from macro-economic growth.

The quantity and quality of education strongly influence the labour force, governance and operations of institutions. Investors are more willing to invest when they know that they will be able to draw on a skilled workforce to make that investment productive.

Evidence suggests that cognitive skills have strong impacts on individual earnings and on national economic growth (Hanushek and Woessmann 2008). For poor people, education can be a bulwark against volatility, as even the fundamental skills learned in primary school can build resilience and aid the survival of families when government services are deficient or during times of economic crisis. Providing access to education and learning can help to eradicate poverty even before it begins to yield returns in the labour market (Stern 2002). Pre-primary education establishes a foundation on which all later schooling can build. Ongoing

learning for adults broadens choices for productive and fulfilling lives (UN Women 2016). Determining effective ways to equip youth with skills is important to investing in their future and helping them realise their potential. Ongoing learning for adults broadens choices for productive and fulfilling lives.

It is therefore important to invest in education and learning – from the foundational years of ECCE to TVET and tertiary education, and on to continuing professional development and workplace learning – to provide children and young people with relevant skills, and for communities to be resilient to changes and able to preserve the environment and its resources.

The international development community increasingly expresses interest in tertiary education, hence shifting the focus from primary education. Tertiary education contributes to a wide range of economic and human development outcomes in low- and lower-middle-income countries, such as:

- stronger impact on economic growth than lower levels of education;
- increased earnings of graduates, and positive impact on productivity in the workplace;
- increased likelihood of technological uptake and adaptation;
- benefits related to health, gender equality and democracy; and
- contribution to the strengthening of institutions, and the forming of professionals in key areas of sustainable development.

Oketch et al. (2014), however, observe that the 'pathways to impact' rest on certain assumptions, including adequate primary and secondary education, quality of research, teaching and learning, academic freedom, and equality of access and opportunities within tertiary education. Poor-quality teaching and curricula, and the lack of a conducive research environment, represent major barriers within the educational system in achieving projected impacts.

Structuring Knowledge

Learning outcomes have traditionally been assessed according to *how much* knowledge a student had acquired. Cognitive science increasingly posits that the quality of knowledge is as important as its quantity, with knowledge being multifaceted. Knowledge relates to abstract concepts, how to solve routine problems efficiently, how to master complex and dynamic problem situations, how to master learning strategies, how to regulate one's own emotions and so forth. All these facets interact in contributing to a person's competence.

These facets (also called 'pieces of knowledge' (diSessa 1988)) can differ in their functional characteristics. They can be isolated or interrelated, context bound or context general, abstract or concrete, implicit or conscious, inert or accessible to various degrees. When a person's knowledge is structured in detrimental ways, she/he can have a large amount of knowledge in a particular field but may not be able to apply it to solve relevant real-life problems.

It is common when someone refers to knowledge that they mean only knowledge of facts. In that view, knowledge is something that has to be acquired in addition to other favourable learning outcomes such as conceptual understanding, skills, adaptive competence, or literacy in a domain.

In contrast, modern-day cognitive science shows that even these complex competences arise from well-organised underlying knowledge structures (e.g. Baroody and Dowker 2003; Taatgen (2005). The term 'knowledge' is then used as a generic term referring to the cognitive bases of many kinds of competence including broad, flexible and adaptive – depending on the cognitive organisation of the underlying knowledge.

- Schneider and Stern 2010

Each of the 17 SDGs has a set of targets that recommends or refers to some form of learning, training, educating or knowledge sharing. For example:

- SDG 3, Target 3.7 states, 'By 2030, ensure universal access to sexual and reproductive health-care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes.'
- SDG 8, Target 8.6 states, 'By 2020, substantially reduce the proportion of youth not in employment, education or training.'
- SDG 13, Target 13.3 states, 'Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.'
- SDG 17, Target 17.6 states, 'Enhance North–South, South–South and triangular regional and international cooperation on and access to science, technology and innovation and enhance knowledge sharing on mutually agreed terms, including through improved

coordination among existing mechanisms, in particular at the UN level, and through a global technology facilitation mechanism.'

- SDG 17, Target 17.16 states, 'Enhance the global partnership for sustainable development, complemented by multistakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries, in particular developing countries.'

Over the years, researchers have broadened their scope and gained insights into how interactions with the social and physical environment shape a person's knowledge structures. Making sense of new information by interpreting it in the light of prior knowledge is a fundamental characteristic of all human thinking. Prior knowledge stems from various formal and informal contexts including everyday-life observations, hobbies, media, friends, parents and school instruction. It is therefore important to consider learning that takes place in formal, non-formal and informal educational and learning environments.

	Knowledge and understanding	Skills and applications	Values and attitudes
ECCE	<ul style="list-style-type: none"> • Early interactions and stimulation. • Describe preschool/nursery and associated experiences. • Working together in the classroom. • Learning spaces and stimulating environments. • Play as an important vehicle for learning. • Language and literacy to talk and write about experiences. • Parenting programme focused on mothers and infants. 	<ul style="list-style-type: none"> • Demonstrate ability for sharing and for playing together. • Ability to respond and self-regulate. • Communication – orally and through art. • Developing fine and gross motor skills. • Creative representation (e.g. draw, paint, role play, pretend, make models). • Logical reasoning. • Social skills and behaviours. • School-readiness skills and behaviours that help children from disadvantaged backgrounds to enhance their entry into, and success, at primary-education level. 	<ul style="list-style-type: none"> • Open and expressive communication. • Showing sensitivity to others. • Readiness for school. • Observing school rules. • Participate in play activities and solve problems encountered in play. • Initiative and social relations (e.g. to make plans and decisions, solve problems encountered in play, express feelings and be sensitive to others). • Participation in early learning. • Feel good about personal identity. • Children are more ready for primary school, have better attendance and better cognitive development compared with those who do not attend preschool programmes.
Primary education	<ul style="list-style-type: none"> • My right to schooling. • My responsibility to work hard. • Why learning is important in my life. • What I want to be when I leave school. • Education in other parts of the world. • Introduction to the SDGs as a set of targets with the aim of ending extreme poverty for everyone and tackling climate change. 	<ul style="list-style-type: none"> • Demonstrate appropriate schooling behaviours. • Identify own learning needs for personal development. • Make connections between own lives and those of others throughout the world. • Learning to learn. • Critical and engaged approach towards learning. 	<ul style="list-style-type: none"> • Self-disciplined, self-reliant and integrated citizen. • Values of gratitude and appreciation. • Rights and responsibilities. • Valuing quality education for all. • Appreciate access to education. • Empathy with children who do not have access to schooling. • Appreciation and respect for diversity.
Secondary education	<ul style="list-style-type: none"> • Sustainable development and sustainable lifestyles. • Literacy, skills and competencies needed in the 21st century. • Historic education campaigns (e.g. education for girls, free education, universal primary education). • Role of education as a human right and the role that education plays in ensuring human rights. 	<ul style="list-style-type: none"> • Explain and critically analyse reasons for unequal access to education; the differences in girl and boy participation rates in education, where applicable; and the reasons for lack of access to education. • Analyse, evaluate and synthesise complex issues and apply learning in new contexts. 	<ul style="list-style-type: none"> • Recognise the reality of the world, of oneself and of others. • Value education as a human right. • Co-operate to pursue a common goal, such as inquiring about a public issue or responding to a community problem. • Girls are empowered to better address the challenges they face in the transition from school to work.

	Knowledge and understanding	Skills and applications	Values and attitudes
TVET	<ul style="list-style-type: none"> Skills for employability and entrepreneurship courses. Sustainable development. Eco-space, ecological footprint, natural capitalism, eco-efficiency. Lifecycles analysis, triple bottom line, environmental management system. Economic literacy, sustainable production/consumption. Managing small enterprises. Application of 6 Rs: reduce, reuse, renew, recycle repair and rethink perspectives. The changing nature of work. 	<ul style="list-style-type: none"> Work independently and in teams, with integrity and honour, honesty, punctuality and responsibility. Adapt to varying situations. Identify existing TVET programmes that need to be updated. Use logical–abstract thinking to diagnose problems, research and apply knowledge to propose solutions, and design and implement those solutions. Application of concepts related to sustainable development in the work place. 	<ul style="list-style-type: none"> Values education, continues learning and pursues lifelong education in a learning society. Value and unleash the transformative potential of TVET. Plan a quality education awareness campaign or a community teaching and learning project. Envisioning alternative ways of working.
Tertiary education	<ul style="list-style-type: none"> Education as a public good. Education as a global common good. Education as a fundamental human right and a basis for guaranteeing the realisation of other rights. Sustainable development education and lifelong learning. Teacher education, pedagogy and andragogy. Competency–based curriculum and assessment of learning outcomes. Governance and management. Science, technology, engineering and mathematics (STEM)–related programmes and courses. 	<ul style="list-style-type: none"> Reconcile education to allow space for diverse ways of knowing and new ways of being and becoming that reflect inclusivity. Build on SDG 4 to find out where people’s true interests lie and help to make training in these fields possible. Describe the relationship between education and sustainable development. Describe the situational context of learning in local and national domains. Analyse the role that educators might play in degendering education. Research factors that affect success in primary and secondary education. 	<ul style="list-style-type: none"> Appreciation of the intrinsic value of quality education for all. Ambition to succeed in the larger community and the global realities of work and life. Appreciate and value the social benefits of education. Value different forms of knowledge including indigenous knowledge. Value education as a tool to act upon societal inequities. Appreciate education as a fundamental human right.
	<ul style="list-style-type: none"> Living and working with children: growth and development programmes for parents and teachers. Training to improve the capacity of the early childcare workforce. Understanding of the range of human rights as interrelated with education. The situational domain of teaching and learning nationally and globally. Understand the concept of education for sustainable development. 	<ul style="list-style-type: none"> Application of knowledge to create age-appropriate learning environments for preschoolers and primary-school pupils. Ability to deliver education based on the multifaceted nature of and the various influences on child development and the universal rights of children (the right to food, shelter, safety and a peaceable existence). 	<ul style="list-style-type: none"> Awareness of the value of inclusivity. Appreciation of gender equality. Commitment to the human rights agenda. Contribute to nation building and economic and social development through education. Value ECCE as the starting point for lifelong learning. Empowered kindergarten teachers and mothers, especially from underserved families.

	Knowledge and understanding	Skills and applications	Values and attitudes
Adult education	<ul style="list-style-type: none"> • Education as a public good. • Education as a fundamental human right and the basis for ensuring the realisation of other rights. • Reasons for adults and children being unable to access education. • The need for basic literacy, numeracy and family literacy. • The importance of lifelong learning and skills development for sustainable development. • The role of non-formal basic education and open learning for continuous education and learning. • Knowledge of the importance of children's schooling, and of parental support for children's education. 	<ul style="list-style-type: none"> • Ability to analyse and identify own learning needs for personal development. • Identify possibilities for own skills development and learning opportunities. • Analyse the role of poverty and gender in preventing adults and children from accessing education. • Create activities or educational experiences that meet the physical, intellectual, social and emotional needs of children at different stages of development. 	<ul style="list-style-type: none"> • Value education and encourage children to value education. • Actively access learning for self-development, employment, leisure and social activities. • Awareness of the importance of 'self' for improving own life and employment possibilities. • Value opportunity to learn at any level and stage of life (lifelong learning) • Ongoing parental and community support and engagement.

7. Goal 5 – Gender Equality

Achieve gender equality and empower all women and girls

The 2030 Agenda recognises gender equality and the empowerment of women and girls as a fundamental dimension of equitable and inclusive development. Over the past few decades, large strides have been made to empower women and girls and towards achieving gender equality.

Globally, this includes reductions in child, early and forced marriage and in maternal mortality rates, advances in legislation addressing gender-based violence and promoting gender equality, and improved access to sexual and reproductive health services and to education.

A child born to a literate mother is 50 per cent more likely to survive past the age of five than a child born to an illiterate mother, as an educated mother improves her children's nutrition and safety (UNESCO 2011). In fact, the most effective investment for achieving long-term health benefits is to educate girls and women. According to Save the Children (Geoghegan 2005) in *State of the World's Mothers 2005: The Power and Promise of Girls' Education*, educated girls and women marry later, have lower maternal and infant mortality rates, have fewer and healthier children, have greater earning capacity, are more likely to participate in political activities, are less likely to be HIV positive, and are more likely to send their own children to school. One additional year of education reduces childbearing by 0.3 to 0.5 children per woman, and educated women are half as likely to have a child that dies before the age of 5 years. These data have led to increased international focus on girls' education and the recognition that it is often the single most powerful factor affecting health outcomes such as infant mortality or maternal mortality.

One additional school year can increase a woman's earnings by up to 20 per cent, according to World Bank studies (Psacharopoulos and Patrinos 2002), while each additional year of schooling raises average annual gross domestic product (GDP) growth by 0.37 per cent (UNESCO 2011). However, employment conditions, prospects of

advancement and pay equality have not increased in line with female participation in education and the labour market (International Labour Organization [ILO] 2011).

Barriers to equality hold strong, with discrimination and disparities remaining a challenge in all countries and an impediment to sustainable development both nationally and globally. Progress has been uneven, with some countries showing stagnation in improvement, others regression, and with growing urban/rural and socio-economic divides, and disproportionate impact on marginalised groups including migrants (UN Women 2015).

Denial of equal rights to inheritance, lack of access to decent work, assets and formal credit, and engagement in unpaid care work continues to disproportionately impact women and girls. While some regions have seen growth in national female political representation, women remain significantly underrepresented, hindering female participation in high-level decision making (UN Women 2015).

Gender-based violence remains a grave violation of human rights. Harmful practices, such as female genital mutilation (FGM) and child, early and forced marriage persist. Data suggests that at least 200 million women and girls across 30 countries have undergone the practice of FGM, with a significant increase expected in line with population growth over the next 15 years (UNICEF 2016). In addition, women are at higher risk of being infected with HIV, and while significant reductions in maternal mortality have been seen globally, high levels persist in southern Asia and sub-Saharan Africa, accounting for 86 per cent of global maternal mortality in 2013 (UN 2014).

Gender inequalities and vulnerabilities are entrenched in society, perpetuated by norms and reinforced by stereotypes. Realisation of gender equality as a human right and empowerment of women and girls cannot be addressed in isolation, as barriers are embedded in cultural, political, economic and environmental dynamics. Without action, inequalities and vulnerabilities will intensify, strained by emerging challenges such as climate change and the rise of violent extremism.

There remains a need for widespread change that addresses the social constructs of unequal gender value in terms of contributions, entitlements and access, eliminates stereotypes and attitudes that reinforce and perpetuate inequalities (including traditional gender roles/expectations and favourable treatment towards boys), and allows women to fully and productively participate in society and the economy. Education can help facilitate this necessary societal change, and contribute to the social and economic development and resilience building of women and girls. Steps include improving the quality of education and provision of gender-responsive learning environments (including addressing gender-

based violence, gender biases and stereotypes in curricula, and increased support for the workforce transition into fields of low female participation), and facilitation of peer-to-peer, intergenerational and public dialogue and debate.

Gender mainstreaming needs to reach all components of education, in teaching pedagogy and materials, teachers, school and community leaders, infrastructure, parents, and the greater community. Education needs to extend beyond equality in access, providing equal treatment and opportunity to both female and male learners across the life course, and also to extend to target society as a whole.

	Knowledge and understanding	Skills and applications	Values and attitudes
ECCE	<ul style="list-style-type: none"> Learn about people and places through storytelling and play. Learn about sharing and being kind to all. Learn how to make choices during play. 	<ul style="list-style-type: none"> Ability to play positively with boys and girls. Communication skills. Ability to communicate needs, wants and preferences. 	<ul style="list-style-type: none"> Boys and girls value themselves and others. Treat others fairly and with kindness. Collaborative learning. Confidence to take part in new experiences and make choices.
Primary education	<ul style="list-style-type: none"> Gender roles as social constructs. Distinguish between biological sex, gender identity and gender expression. Separate adjectives, jobs, domestic duties and childcare responsibilities into female, male and gender-neutral sets. 	<ul style="list-style-type: none"> Analyse how gender affects everyday lives and devise solutions for any challenges. Take equal responsibility in classrooms and school activities. Analyse basic information on gender inequality worldwide. 	<ul style="list-style-type: none"> Girls and boys respect each other. Advocate for a harassment-free school or learning environment. Shared responsibility between boys and girls in classrooms and school activities. Girls and boys participate in extracurricular activities. Awareness of cultural practices that affect girls' and women's rights in society.
Secondary education	<ul style="list-style-type: none"> The impact of gender roles on the identity and rights of girls and boys. Meaning of the terms 'rights' and 'equality'. Learn from case studies from different Commonwealth countries. 	<ul style="list-style-type: none"> Analyse norms that hamper gender inequality. Think critically about socially ascribed gender roles and stereotypes in jobs, sports and the family. Identify issues of gender inequality in the school or community on which pupils could take action. Develop positive notions of gender. 	<ul style="list-style-type: none"> Gender equality and empowered women and girls. Degendered understanding of professions, sports and family roles. Exercise later in life, active citizenship and claim rights relating to gender equality.
	<ul style="list-style-type: none"> Gender-based violence through case studies. Types of violence including psychological, sexual, etc. International documents and laws addressing gender-based violence. Gender and human rights. Relationship between women's education and women's empowerment. Key international documents and laws addressing gender-based violence. Social construction of gender. Gender dynamics in roles, professions, sport and households. Inequalities and injustice relating to gender and human rights including access to housing, transport, land, water and natural resources. 	<ul style="list-style-type: none"> Learn the causes of violence and design strategies for mitigating gender-based violence. Analyse current laws at the national and international levels to protect women, men, girls and boys and develop improvements. Develop approaches to improving women's access to and success in education. Formulate strategies to overcome gender bias and evaluate the role socialisation plays in 'acceptable' emotional display. Compare and contrast female education in Commonwealth countries. 	<ul style="list-style-type: none"> Respect the legitimacy of international and regional instruments to end violence against women and girls. Increased gender empowerment. Awareness of social justice. Respect for diversity. Challenge traditional gender roles; as well as violence and gender discrimination. Value equal rights and willingness to bring about positive change. Appreciation of the impact of gender-based violence during peacetime and wartime. Engaged global citizens who ensure global gender equality.

	Knowledge and understanding	Skills and applications	Values and attitudes
TVET	<ul style="list-style-type: none"> Gender economics. Barriers to women's education and economic participation. Gender mainstreaming on issues of budgeting, development, etc. 	<ul style="list-style-type: none"> Analyse how gender inequality affects women in health, education, the labour market and national political participation, and develop solutions. 	<ul style="list-style-type: none"> Call to action. Analysis of gendered situations. Advocacy for good leadership qualities. Deepen understanding of gender inequality.
Tertiary education	<ul style="list-style-type: none"> Barriers to women's education and economic participation. Teacher development and awareness of hidden curricula. Teacher development of inclusive education for girls. Encouraging men/boys to participate in discussions on the impact of patriarchal social relations. Focus on boys for developing an understanding of equality. Laws and regulations that guarantee women and men full and equal access to sexual and reproductive health care, information and education. Gender budget tracking. 	<ul style="list-style-type: none"> Analyse the role of the hidden curriculum in education. Ability to develop gender-neutral curricula and implement gender-neutral teaching practices. Give equal attention and treatment to boys and girls. Track public allocations for gender equality. 	<ul style="list-style-type: none"> Awareness of the hidden curriculum and how this supports gender inequality. Deepen understanding of gender inequality, particularly within education settings. Gender responsive classroom interaction. Greater social accountability. Better design and implementation of programmes and policies that support marginalised girls and women.
Adult education	<ul style="list-style-type: none"> Sexual and reproductive health information and education. Assess the different implications for women and men of any planned policy action. Understanding of rights and harmful practices. 	<ul style="list-style-type: none"> Decision making over sexual and reproductive health. Gender audit of policies and legislation. Ensure strategies are sustainable to achieve equitable outcomes for women and men, and between different groups of women. 	<ul style="list-style-type: none"> Women's empowerment over sexual and reproductive rights. Critical awareness of gendered policies. Overcome discrimination, sexual harassment, violence against women and girls and other cultural, social, economic and legal barriers to women's economic participation.
	<ul style="list-style-type: none"> Gender and division of labour using 24-hour time chart. Equitable access to land rights and water for productive use. 	<ul style="list-style-type: none"> Analysis of how gender roles lead to gendered division of labour. Understand lack of access to and control over natural resources as a gender inequality and obstacle to development. 	<ul style="list-style-type: none"> Equitable distribution of tasks and labour. Heightened awareness over land rights and ownership. Exercise control over and ownership of assets.
	<ul style="list-style-type: none"> Gender mainstreaming strategy. Combining micro-finance with gender-based curricula to reduce domestic violence rates and increase health knowledge. Monitoring and evaluation methods to share lessons learned and good practices with relevant stakeholders. Vulnerability of women at informal sector sites and ways to mitigate this. Access and utilisation of ICT to unlock educational and employment opportunities. 	<ul style="list-style-type: none"> Assess the different implications for women and men of any planned policy action, including legislation and programmes, in all areas and at all levels. Develop appropriate strategies to support the implementation of an effective gender strategy, aimed at promoting gender equality. Ensure strategies are sustainable to achieve equitable outcomes for women and men, and between different groups of women. 	<ul style="list-style-type: none"> Appreciate the importance of sharing women's work and stories through research and knowledge generation. Value the diversity of men and women, through a multicultural approach offered by mainstreaming. Empowerment, autonomy, confidence and resourcefulness. Active participation in economic activities. Enhanced bargaining power with the household and capacity for economic independence.

8. Goal 6 – Clean Water and Sanitation

Ensure availability and sustainable management of water and sanitation for all

Although 71 per cent of the earth's surface is covered with water, only 0.6 per cent of it is potable and exists as land surface water. The vast majority (97 per cent) of water is in oceans, with an additional 2.4 per cent in the form of glaciers and ice caps. Populations' need to access clean water is observable every day in terms of water consumption, including for drinking, agriculture, industry, waste management and fisheries. Conversely, water scarcity is estimated to affect 40 million people globally and is expected to increase, amplified by climate change. Water stress is already being felt by roughly two billion people across all continents, and is hindering social and economic development and sustainability of natural resources (United Nations Economic and Social Council [ECOSOC] 2016).

Competing societal, economic and environmental demands put increasing pressure on water resources. Stressors such as climate change, pollution, disruption of hydrological pathways, population growth and economic activities increasingly degrade quality and outpace recirculation within a finite supply. Competing demands must be reconciled with supply, and sustainable management must be put into practice. Education can provide an understanding of the challenges that exist in ensuring availability and sustainable management of water, sanitation and hygiene (WASH). Whatever the level or form of education, it can shape respect for the intrinsic value of water and for water as a finite resource.

The 2012 report of the UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water (World Health Organization [WHO] 2012) has summarised the efforts and approaches of 74 low- and middle-income countries and 24 external support agencies. The report states that although some countries are reporting strong progress towards national sustainable WASH targets, for

the majority of countries, human and financial resource constraints, especially for sanitation, are significantly impeding progress.

Education is an essential tool in addressing human resource capacity and developing ownership for improved water and sanitation, empowering individuals to change their behaviours and advocate wider change, to engage in data collection and monitoring, infrastructure development and other active measures, and to build up a stronger and unified voice at national and international levels.

It starts with water literacy, including knowledge of how to use well water and prepare water for consumption, and knowledge of wastewater treatment. Water literacy refers to appropriate knowledge about various aspects of water use and integrated water resources management in order to ensure safer water consumption and to contribute to disaster risk reduction (DRR). Learners can develop the skills and abilities to implement proven water-use efficiencies and water-related ecosystem protection practices.

Access to water, in turn, affects educational conditions and opportunities. For example, the rate of school attendance of girls improves when water is accessible: a 15-minute reduction in water collection time can increase the proportion of girls attending school in Ghana by 8–12 per cent (Nauges and Strand 2013).

Indeed, clear links exist between SDG 6 and all other SDGs. Availability of clean drinking water and sanitation is a human right in itself, whilst sustainable management fosters resilience to climate change and other stressors, and directly impacts on food security. Access to safe and affordable drinking water and equitable sanitation and hygiene are integral to human health and gender equality, while safe management of faecal waste and wastewater protect environmental and public health.

Proven technologies and practices already exist for water and sanitation, for which education can act as a springboard for uptake. There should also

be consideration of labour market needs and links to new technologies, trades and competencies, for instance through co-operation between TVET and the water industry, and by fostering the development of emerging skills needed in the water sector. Programmes on clean energy and clean water are necessary for sustainable development.

Co-operation between industries and TVET and tertiary institutions is required to acquire a better understanding of skills, challenges and demands by industry. Updated occupational employment projections are needed to influence curricula, and education and training programmes.

According to new employment trends, formal, non-formal and informal training must reflect these trends in order to train the workforce with new and emerging operating techniques and technologies, to raise their skills performance and prepare them for lifelong learning, as well as to support green society and green economy.

Water literacy is essential for natural disaster response and recovery. Insufficient knowledge about the risks associated with water-quality deterioration after water-related disasters have resulted in negative health effects such as infectious diseases (Mosley et al. 2004). Water-related

DRR education is increasingly important, in light of global warming and other environmental factors that are increasing the frequency and scale of water-related disasters around the world.

The Hyogo Framework for Action 2005–2015 (UNISDR 2005) pointed to the importance of ensuring access to appropriate training and educational opportunities for those populations considered socially vulnerable, including women.

In order for personal- and community-level water literacy to improve, water supply and irrigation facilities must be developed and enhanced at national and local levels, and awareness-raising activities must be conducted for the general public. This means that national and local governments must become fully knowledgeable about water and sanitation-related issues, so that they can successfully implement concrete measures. Safety and disaster-reduction training is also indispensable, not only for local communities but also for local and national government representatives.

Education can further inspire innovation and the development of expertise, support co-operation and collaboration in multisectoral, multiscale and transboundary management, and develop the capacity needed for widespread and long-term sustainable use and management.

	Knowledge and understanding	Skills and applications	Values and attitudes
ECCE	<ul style="list-style-type: none"> Hand washing, water and sanitation and hygiene. Hand-washing education. Hand-washing station. Making water use at home more visible through water lessons to develop sense of responsibility. Visualisation of the volume of water used in daily actions and habits. Learning through water play. 	<ul style="list-style-type: none"> Problem-solving skills: understand why and how things happen, e.g. given sinking and floating objects, a child will soon discover that just because something is large in size it does not mean it will sink. Hand washing and sanitation skills. 	<ul style="list-style-type: none"> Responsible hygienic daily habits and routines. Creative development as water encourages children to use their imagination. Try out new ideas and solutions. Aware of beach dangers, e.g. tides.
Primary education	<ul style="list-style-type: none"> Use of water in domestic activities for cleanliness, hygiene, relaxation and food preparation, and formation of daily habits, routines and lifestyles. Deconstructing the routines, habits and lifestyles in which water plays a part, and the influence of peers, family and social norms on water use. Principle of water abundance v. water scarcity, both physical and economic, and as a finite resource. Potential effects of dirty water; poor health, increased hunger, poverty and lack of access to education. Water resources and utilisation by humans (agriculture, industrial, domestic, recreational, fisheries). Safe disposal of wastewater, human excreta, solid waste. Household sanitation and food hygiene. Basic understanding of water science – hydrology, the hydrologic cycle and connection to climate change. 	<ul style="list-style-type: none"> Understanding and conscious water consumption. Understanding of water-related issues for behavioural changes. Understanding of water scarcity and abundance. Conceptualising water flowing through landscape-scale systems. Apply understanding of the structure of watersheds to explain the movement of water and other substances. Ability to interpret common representations, such as maps of waterways. Safe handling of drinking water. Understanding how water moves through environmental systems, interacts with other substances, dissolves and moves certain substances underground. 	<ul style="list-style-type: none"> Responsible and sustainable consumption. Motivation to change patterns of unsustainable consumption. Understand appropriate personal hygiene: washing hands, brushing teeth, etc. Safe use of toilets and urinals, including cleansing and washing. Responsible and sustainable consumption. Motivation to change patterns of unsustainable consumption. Link collection and treatment of solid waste with overall health risks. Understand relationship between water and insect breeding and avoid risks. Sensitised to the ways that water is borrowed from and returned to nature through human activities. Making informed decisions about water at an individual or societal level. Participate in community decisions about how to manage landfills.
Secondary education	<ul style="list-style-type: none"> Water footprints and how to calculate them. Virtual water – the embedded water footprint of imported products and food. How water travels around the world to meet demand. Groundwater and healthy watersheds. Integrated water cycles, with human demand as part of the system. Infrastructure: how we move and control surface water, and process wastewater. The energy-water connection. Water, health and sanitation. 	<ul style="list-style-type: none"> Skills to adjust to ways water is used when facing adverse impacts on the hydrologic cycle related to climate change, particularly shortage in water supply. Knowledge for positive impact on human health. Understanding of structure of human-engineered systems (water collection, water cleaning, water distribution). Changes in personal behaviour. Ability to make good water conservation choices. 	<ul style="list-style-type: none"> Personal responsibility and control of water consumption. Preservation of water reserves and sources in conditions of water scarcity, and efforts to mitigate impact on food supplies. Understanding and acting responsibly on environmental issues related to maintaining and protecting water quality for all life systems on Earth. Prepared to manage competing demands: agriculture, industry, growing populations in urban centres, wildlife.

	Knowledge and understanding	Skills and applications	Values and attitudes
TVET	<ul style="list-style-type: none"> Water supply technology: maintenance and monitoring machines and plants for water production, preparing, routing, laying and repairing water pipes. Wastewater technology: preparing wastewater and maintaining wastewater pipe systems, and monitoring and steering operations in sewage treatment plants and canal systems. Recycling and waste disposal management: organising the collection and sorting of waste, its reuse or environmentally sound disposal. Pipe, canal, and industrial services: cleaning, monitoring and attending wastewater pipelines and canals, tanks and waste structures in the private and public spheres. 	<ul style="list-style-type: none"> Assessment of energy and water use for wastewater management systems, improved renewable energy use, enhanced water storage and water resource management. Skills and capacity (including through TVET) to use natural resources more sustainably and promote hygiene. Ability to harness wind, solar, hydropower and geothermal energy. Monitor the evolution of knowledge and technology in the water use; identify existing TVET programmes that need to be updated. 	<ul style="list-style-type: none"> Involvement in renewable energy technologies. Demonstrate knowledge about the possibilities for keeping water and air clean, for waste disposal and recycling. Promote information about the effects environmental protection measures will have on businesses. Make professional contributions to societal transformation. Take interest in greening TVET institutions. Raise awareness of the need to save water and the link between unsafe drinking water and disease.
Tertiary education	<ul style="list-style-type: none"> Innovation in technology management, including integrated water resource management and treatment, and environmental modelling. Soil and water resource management practices, including improved methods for rainwater harvesting and irrigation. Transdisciplinary water security and research. Research on scarcity of fresh water, particularly in small island states. Governance to address water management crisis. Water security. Sustainable water resource base. Water infrastructure resilience, water governance and adaptive management. Water security complexities including competing demands (e.g. human right v. commodification), transboundary management. Links between water resources, poverty, conflict and the economy. Understanding of inequalities and complexities involved in water resource access and use, pollution, poverty. 	<ul style="list-style-type: none"> Use ICT to improve accountability of service providers. Capacity to set up low-cost and easy-to-manage technology to address groundwater scarcity. Implement water audits for populations to appreciate their water situation in a conscious way. Develop financially sustainable models for water projects, using fees and tariff structures that reflect future costs, and manage usage while subsidising water access for the poor. Innovation in technology and governance for sustainable water management. Water demand analysis and management, water demand modelling, water distribution systems analysis. Develop and implement water-related climate change mitigation and adaptation strategies. Applied research to promote access to clean water and sanitation in resource-poor areas. 	<ul style="list-style-type: none"> Committed to reducing the ecological footprint by environmentally friendly management of energy, water and other resources, waste management and reducing emissions. Make professional contributions to societal transformation. Raise awareness of current water crises. Reduce water usage and avoid releasing effluent. Solution-minded approach to sustainable water use and ecosystem health. Valuing water and sanitation as a human right, and proactive in addressing inequalities and competing uses.

	Knowledge and understanding	Skills and applications	Values and attitudes
Adult education	<ul style="list-style-type: none"> • How best to use clean water sources and avoid disease transmission. • Health problems caused by consumption of polluted water. • Training on WASH including for local communities. • Transboundary water management for climate resilience. • Watershed management. • Fresh water management and conservation. • Soil and water resource management practices, including improved methods for rainwater harvesting and irrigation. • Human ecology resilience. • Water management for climate change resilience. • Understanding of water sustainability in relation to health, livelihood and individual/community resilience. • Train communities and households to construct latrines from local materials. 	<ul style="list-style-type: none"> • Behavioural change and benefits of clean water optimised. • Form village WASH committees with balanced gender representation. • Organise 'small watershed conservation' campaign. • Implementation of water efficiency behaviours and technologies (e.g. use of different irrigation methods and avoiding contamination of waterways in agriculture). • Ability to educate others within the community, and instil sustainable water management and respect for ecosystem health in younger generations. • Capacity to make the best use of the water resources available. 	<ul style="list-style-type: none"> • Appreciate importance of WASH practices such as handwashing with soap. • Sustained behavioural change. • Engagement within the community and appreciation of the need for sustainable use of water. • Resolve conflicts in connection with shared water sources. • Self-reflection in water management and as a change maker. • Respect for watershed health. • Intrinsic value of water. • Leverage local knowledge. • Value indigenous communities' approach to water.

9. Goal 7 – Affordable and Clean Energy

Ensure access to affordable, reliable, sustainable and modern energy for all

Attainment of SDG 7, and development more broadly, necessitates an energy transformation that is both sustainable and just. Universal access to affordable energy, greater energy efficiency and increased use of renewable energy sources are critical in ensuring sustainable energy systems for continued social and economic development, and environmental health.

As it stands, demand for energy continues to rise to meet social and economic requirements. While the proportion of people with access to electricity has increased, one in five people still lack access to modern electricity (World Bank/International Energy Agency 2015). Use of renewable energy is accelerating, fuelled by government regulations and technological development and dissemination, but electricity production remains the dominant emitter of greenhouse gasses, accounting for roughly 60 per cent of global emissions. Furthermore, energy intensity is decreasing at a significant pace, but the rate of progress is only two thirds of that needed to meet the improved energy efficiency target (ECOSOC 2016).

Progress towards use of clean fuels and technologies for cooking and heating has seen negligible progress since 2010, as population growth outpaces net gains. Nearly three billion people (a figure that continues to increase) still rely on wood, charcoal, dung and coal (World Bank/International Energy Agency 2015). As a direct result of this dependence, over four million premature deaths a year occur due to indoor air pollution. Globally, 1.1 billion people remain without access to electricity.

A radical energy transformation is needed, one that rethinks energy production, distribution and consumption. This transition must support social equity, environmental health, and a reduction in carbon intensity, without which social and economic development will be constrained. To drive this transition, people must understand why

it is important (including current and future social, economic and environmental ramifications of the current energy system), and what can be done to facilitate it. Education has a critical role to play in the energy transition, and in promoting uptake of renewable energy sources and energy conservation, including how to switch to solar energy. Educating potential off-grid users is critical for the success of solar technology, including through youth entrepreneurship programmes.

Formal, informal and non-formal education is needed for political, multisectoral and transformative change. By introducing the knowledge and skills to create change, and values that support the energy transition, all learners can make informed decisions as energy users. Knowledge and empowerment of political and industry leaders is essential in allowing all end users access to a clean and affordable modern energy supply. Individuals can learn to be at the heart of the scaling up of renewable energy, the development and implementation of decentralised solutions, and of engagement for the exchange of ideas, data, evidence and best practice, allowing for full participation in and benefit from this transition. Understanding of alternative choices in relation to transport, energy supply source, potential for innovation and co-operation, and technological, infrastructure and financial availability will support this transition. Only with education can capacity development and the sustainable transfer of knowledge and technologies occur. Tertiary institutions can develop curricula to establish effective methods and tools for the development and diffusion of sustainable energy systems.

The World Bank suggests that many measures for energy efficiency are financially viable for investors, but require consumer education for realisation of low-cost savings (World Bank 2010). This transition requires the adoption of actions as simple as turning of unused electrical appliances, integrating renewable technologies into industrial processes, increasing and diversifying energy supply markets, addressing energy needs within refugee camps, and brokering international financial aid and technology transfer deals.

	Knowledge and understanding	Skills and applications	Values and attitudes
ECCE	<ul style="list-style-type: none"> Electricity, light, heat/cooling, sun. Safety when using electricity. Safety with things that are hot. 	<ul style="list-style-type: none"> Understanding of what energy is and where it comes from. 	<ul style="list-style-type: none"> Conservation and safety. Appreciation of the different forms energy can take.
Primary education	<ul style="list-style-type: none"> Basic concepts of energy and consumptive uses (e.g. powering cars). Different forms of energy production (e.g. fossil fuels, wind energy, etc.), associated technologies, and why different forms of energy production are best used in different geographies and contexts. Introduction to the concept of global warming and how it links to human energy production and consumption. 	<ul style="list-style-type: none"> Act as an energy monitor (including in the classroom). Identification and practice of actions and choices for sustainable and safe living. Uses of alternative energy at home, school and in the wider community (e.g. solar energy for cooking and heating). Application of simple calculations and analysis of different energy choices and uses (e.g. efficiency and cost analysis). 	<ul style="list-style-type: none"> Environmentally sound ethics. Commitment to energy conservation. Daily living habits and behaviours for sustainable living. Consumptive behavioural change. Reuse items such as plastic bags, glass jars, plastic containers, envelopes and paper.
Secondary education	<ul style="list-style-type: none"> Energy production cycles for different forms of energy (e.g. geothermal energy from the earth's heat). Concepts such as ecological footprint and ecological accounting. Differences in energy usage, means of production, affordability, safety and reliability across the world. Research alternative energy sources (e.g. solar cooker). 	<ul style="list-style-type: none"> Assessment of implications of lifestyle choices, and knowledge to make informed choices as energy users. Linking human actions and climate change (e.g. assessment of energy consumption using ecological footprint calculations). Analysis of per capita energy usage and variation across the world. Ability to assess appropriateness of energy choices in different contexts. Design, develop and testing of alternative energy sources. 	<ul style="list-style-type: none"> Belief in anthropogenic climate change, and the responsibility of humans to address climate change and associated issues. Personal responsibility for sustainable life choices. Universal access to safe and reliable energy. Collective action and co-operation to drive change. Reduce the overall amount of electricity, packaging and petrol used.
TVET	<ul style="list-style-type: none"> Different types of energy, with a focus on renewable energy. Renewable energy infrastructure and technologies, and energy efficiencies. Research into green trade opportunities. Highlight link between energy and climate change, mitigation and adaptive strategies. 	<ul style="list-style-type: none"> Energy and environmental management, auditing, design and implementation of sustainable energy transitions. Promotion of improved energy conservation and uptake of renewables. Green and renewable energy skills, application of renewable energy technologies. 	<ul style="list-style-type: none"> Increased awareness of the need for sustainable energy production. Ethical awareness pertaining to energy production and consumption. Environmental consciousness and advocacy for mainstream change.

	Knowledge and understanding	Skills and applications	Values and attitudes
Tertiary education	<ul style="list-style-type: none"> Complex understanding of the political, social and economic dimensions of energy, e.g. conflicting interests, rights of indigenous peoples, etc., and environmental and economic policies. In-depth research into green economy (e.g. trade opportunities, green investment, improvement models that support pro-poor growth and development, etc.). Research into sustainable energy development, costs and competition, alternative forms, socio-economic implications, etc. 	<ul style="list-style-type: none"> Energy, climate and pro-poor modelling and design. Economic and energy research to drive the transition towards a green economy. Managing and sustaining energy transitions and green trade opportunities. Research and development of energy sources, infrastructure and technological innovations (e.g. energy system engineering and design, wind mapping/modelling, heat storage). Engagement with stakeholders to support co-operative change. 	<ul style="list-style-type: none"> Advocate political change for a green economy and participation in development. Collaborative and proactive approach to change, and need for collective action. Focus of expanding and advancing technology, infrastructure and affordable access in developing countries. Motivated to influence cultural shift for sustainable energy adoption and addressing climate change. Concern for equitable access, and availability of safe and affordable energy solutions.
Adult education	<ul style="list-style-type: none"> Understanding of energy sources and different technologies, their application and how to source them. Understanding of cultural changes that are needed for sustainability. Consumer education. 	<ul style="list-style-type: none"> Ability to assess appropriateness of different energy sources and make informed energy decisions (e.g. cooking fuels and technologies). Ability to access resources and services for sustainable living. Informing families and wider community about energy saving options. 	<ul style="list-style-type: none"> Willingness to change behaviour and practices. Proactive in fostering a resilient family and community. Self-confidence to actively promote cultural change and sustainable living.

10. Goal 8 – Decent Work and Economic Growth

Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

'Work is central to people's well-being. In addition to providing income, work can pave the way for broader social and economic advancement, strengthening individuals, their families and communities. Such progress, however, hinges on work that is decent. Decent work sums up the aspirations of people in their working lives.'

-ILO Decent Work Agenda (ILO 2007)

SDG 8 aims to 'promote sustained, inclusive and sustainable economic growth, full and productive employment, and decent work for all', bolstered by higher levels of productivity and technological innovation. This includes the protection of workers' rights, combatting inequalities and child labour, eradicating forced labour, modern slavery and human trafficking, and promoting safe and secure working environments.

However, widening inequalities, growing unemployment, and financial exclusion persist. In sub-Saharan Africa, average worker output is 23 times less than that in developed countries, while 21 per cent of children are engaged in child labour activities (ECOSOC 2016). Financial exclusion disproportionately affects women and the poor, with a gap in access to financial services that is exacerbated by legal and cultural norms as well as discrimination, and information and technological deficit (Demirguc-Kunt et al. 2013; ECOSOC 2016). Global growth for 2016 is projected to remain unchanged from 2015, with a 2.4 per cent growth impacted by rising private-sector debt and geopolitical uncertainty (World Bank 2016).

In 2013, 212 million people were unemployed globally, with World Bank projecting an increase to 215 million by 2018 (ILO 2014). Job growth, however, is not keeping pace with annual entry into the labour market, as during this 5-year period, 42.6 million people are expected to enter the labour market annually, while only 40 million net new jobs are expected to be created annually.

Differential demographic changes across the world also present different challenges, with some countries already experiencing or set to experience a youth bulge, and others an ageing workforce. Evolving circumstances require the leveraging of demographic changes, accelerating job creation in many countries, sustaining productivity growth and adapting to an ageing population in others. Sustainable development relies on people being able to work and to move out of poverty. People therefore need skills to get employed or re-employed, and knowledge to exercise capacity to use sustainable production practices. Target 8.6 under this goal calls for substantial reduction by 2020 of youth not in employment, education or training.

Both public and private sectors need to be engaged in linking training opportunities and employment, and in supporting continued development of skills and knowledge. Widespread skills mismatch requires education to more closely align with current and evolving market needs, while building a resilient, diversified and trained workforce for sustained economic growth.

The high rate of technological change necessitates strong links between industry and education to ensure evolution of skills development, and learner development of demand-driven skills. Education content should be adapted to life and job market requirements in terms of skills and focusing on easing the school-to-work transition and preventing labour market mismatches.

Education is indeed essential in developing in citizens the knowledge, skills, and values and attitudes to gain decent and productive work.

Education directly influences worker productivity, and entrepreneurial potential, and is essential for addressing high unemployment and skills mismatch, and fostering opportunities for all citizens and sustained growth. It is critical to developing learners ready to enter the workforce, with workforce readiness skills from basic literacy, numeracy, finance and social/employment conduct skills, through to highly specialised skills such as green and specialised research skills. These skills can be acquired in various ways including through formal education and training, on-the-job training, continuous learning, TVET, non-formal training, informally through family and community, and through e-learning.

It is also necessary for individuals to learn how to explore work opportunities, understand career processes and appreciate the meaning and purpose of work in people's lives. They should learn what constitutes decent work and safe working practices and environments.

As stated in Section 3.5, equal access to opportunity, and equal pay for work of equal value for male and female contributions, is necessary for gender equality as well as for inclusive economic growth. Education has an important role to play in fostering this change, and providing women and girls with the skills and opportunity to enter the workforce. Education is particularly important to both women and rural youth, allowing them to move from traditional household or agricultural-production activities, to enter the wage sector and/or a broader range of occupations (World Bank 2007). The participation of persons with disabilities or special needs in skills training programmes should be especially encouraged.

Effective harnessing of education for inclusive and sustained economic development requires an evolving and integrated multisectoral approach, accounting for local, national and international dynamics and context.

	Knowledge and understanding	Skills and applications	Values and attitudes
ECCE	<ul style="list-style-type: none"> Helping at home and school. Different types of objects, materials and living things. How things work. Awareness of own surroundings. Work and leisure time. Earning a living. What is fair and equal. What do we need to be happy? 	<ul style="list-style-type: none"> Play in and explore surrounding spaces. Ability to contribute and have a sense of belonging. Eager and able to learn. Relate the work of people in the local community to role play, e.g. a visit to the fire station, farm, building site, post office. 	<ul style="list-style-type: none"> Loving self and others. Learning to respect others. Developing a sense of freedom/independence. Empathy. Sharing. Connectivity. Learning to live together. Appreciate that efforts are valued and respected as an autonomous learner.
Primary education	<ul style="list-style-type: none"> Job classifications. Jobs in the school, community, etc. People who care. Why people work. Work, employment, unemployment, self-employment and enterprise. Social enterprise. The SDGs. What it means to combat inequality. 	<ul style="list-style-type: none"> Explain the different kinds of jobs in other parts of the world. Exploring solutions for inequality. Access and opportunity for all. Holding meetings, budgeting, making rules and selling products through role play. 	<ul style="list-style-type: none"> Appreciation of the multifaceted nature of the world/surroundings. Value/appreciate the resources and services available. Gratitude. Finding positive solutions. Learn to value the different forms of work including paid work, unpaid care work, voluntary work and creative expression.
Secondary education	<ul style="list-style-type: none"> Content focused on easing school-to-work transition. Labour market trends, conditions, salaries, etc. Different types of employment. Jobs available in different parts of the world. Productivity v. responsiveness to crisis/disaster. History of the cooperative movement. Work of cooperatives around the world and links to trade, enterprise, workers' rights, social justice and fair trade. 	<ul style="list-style-type: none"> Risk analysis, risk taking, judgement. Problem solving, critical thinking and devising innovative approaches. Construct own understanding and examples of inequality. How to make good choices and decisions to reduce inequality within a global perspective. Finding positive examples of reducing inequality. Entrepreneurial skills to set up co-operatively run business, such as a fair trade tuck shop. 	<ul style="list-style-type: none"> People-centred mindset. Global mindset and orientation. Mutual respect for all. Appreciate work as a powerful engine of human development. Campaign or advocate against child and forced labour. Value all roles in society. Appreciate values of commitment and hard work. Sensitivity and respect for a changing world. Make ethical choices. Appreciate fairness in trade and principles of shared ownership for mutual benefit.

	Knowledge and understanding	Skills and applications	Values and attitudes
TVET	<ul style="list-style-type: none"> Contribution of an economy to the well-being of people. Understanding financial systems and their influence on economic development (investment, credit, interest rates, inflation and the stock exchange). Formalised on-the-job training and vocational education, featuring closer interaction between educational institutions and industry. Small and medium-sized enterprise business training. Role of co-operatives in the global economy. TVET content adapted to life and job market requirements in terms of skills. Training for rural entrepreneurs, including women and young people. Education content and training in line with economic changes and demand for 'green skills' and 'green jobs'. Training for local leaders to improve their practices and responsiveness to enhance local services. Training for labour inspectors. 	<ul style="list-style-type: none"> Identify children at risk of child labour and work to make sure they attend school. Improve working conditions and social protection. Conduct needs assessment surveys. Ability to conduct a community audit in relation to sustainability. Establish decent work compliance in supply chains. Capacity to set up or manage co-operatives, including utility co-operatives and credit unions. Ability to access micro-credit, capacity building, technical support and mentoring to lead business models. Practical application of ways of increasing access and employment opportunities for others. Ability to respond to employers' expectations. 	<ul style="list-style-type: none"> Campaign against forced labour and trafficking. Encourage formalisation and growth of micro, small and medium-sized enterprises including access to financial services. Coping mechanism and resilience in times of hardship and adversity. Limit exposure to physical/mental health risk factors, as well as to chemicals in the workplace. Motivated to become entrepreneurs. Respect rights to fair and just conditions of work. Knowing that each individual has a role in providing solutions (agency). Take initiative to ensure that the voice of the poor and marginalised is heard. Recognise rural women as farmers and workers.
Tertiary education	<ul style="list-style-type: none"> Changing role of technology. Understanding and matching skills to jobs in a changing environment. Understanding of the labour market requirements and changing educational expectations. Principles of business. Formal and informal labour rights. Individual/psychological effects of unemployment. Nature and condition of work. Impact of current economic decision making on growth of businesses, manufacturing, and availability of decent jobs. Understanding of how present approaches to the world and national economic planning may undermine the potential of youth/adolescent employment roles and opportunities. Theoretical assumptions, models and indicators of economic growth (GDP, Gini index). Structural causes, patriarchal norms, values and practices that do not consider women as individual rights holders, workers and key players for the economic development of countries. 	<ul style="list-style-type: none"> Economical use of resources. Analyse labour markets to increase employment impact. Research, analyse and interpret examples of inequality. Critically analyse the root causes and systems of inequality in the labour market and the differentiation of income. Compare the impact of profit-driven capitalism and conscious capitalism in terms of employment opportunities and the availability of decent work. Develop labour migration indicators, including wage gap between migrants and nationals. Develop time-use data (time spent in paid and unpaid work, by gender). Identify roots of inequalities in labour. Capacity to assess risks associated with poverty, exclusion and youth not engaged in the world of work. Ability to respond to social change. 	<ul style="list-style-type: none"> Global citizenship. Active citizenship. Resilience. Collaborative problem solving and learning. Sensitivity to geopolitical forces. Appreciation of the value of hard work. Recognise that inequality is human made and can therefore be addressed. Belief in the human ability to solve problems. Valuing all roles in society. Responding and acknowledging interconnectedness. Making ethical choices and taking action to ensure rural women's access, ownership and control of livelihoods. Women's participation in decision making, governance and management of productive and natural resources (land, water, forests, livestock, etc.). Resilient, successful workforce.

Adult education	Knowledge and understanding	Skills and applications	Values and attitudes
<ul style="list-style-type: none"> • Continuous learning. • Continuing professional education. • Exploring and developing new skills to adapt to changing environments. • Community empowerment. • Understanding of geopolitical forces in the social and economic environments. • Availability of work opportunities, and what skills are required. 	<ul style="list-style-type: none"> • Construct own understanding and examples of inequality. • Make good choices and decisions to reduce inequality within a global perspective. • Capacity for collective bargaining. • Ability to formalise the informal economy. 	<ul style="list-style-type: none"> • Actively take measures to address 'time poverty', especially for women, due to unpaid work. • Express concerns, organise and participate in the decisions that affect lives. • Take action for equality of opportunity and treatment for all women and men. 	

11. Goal 9 – Industry, Innovation and Infrastructure

Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

SDG 9 consists of three components essential for sustainable development, as outlined in paragraph 64 of the report of the UN Secretary-General, 'Progress towards the Sustainable Development Goals', E/2016/75 (ECOSOC 2016):

- **'Infrastructure'** provides the basic physical systems and structures essential to the operation of a society or enterprise.'
- **'Industrialisation'** drives economic growth, creates job opportunities and thereby reduces income poverty.'
- **'Innovation'** advances the technological capabilities of industrial sectors and prompts the development of new skills.'

Industrialisation, infrastructure and innovation are driving forces behind social and economic development, and are critical to ensuring low-carbon development and environmental sustainability. The world is characterised by uneven industrial growth, and in the industrialisation that has traditionally been carbon-intensive is no longer viable. The incorporation of energy efficiencies and renewable energy into production and distribution is now a necessity, coupled with avoidance of carbon-intensive activities. Increased productivity through environmentally sustainable industrialisation can support job creation, access to decent work, income generation and the promotion of micro, small and medium-sized enterprises (United Nations 2015). Capacity building of developing countries, in particular least developed, landlocked developing and small island developing states, is required for achieving sustainable transport connectivity. Knowledge and skills development are therefore essential to enable countries to develop their capacity in formulating and implementing

policies and plans to enhance transport connectivity with a skilled workforce, and to achieve smart and green transport corridors.

Quality infrastructure is essential for sustainable development, and includes supporting access to clean and affordable energy, basic sanitation facilities, drinking water, telecommunications, and health, education and financial services. Currently, however, a large deficit exists in the development of new infrastructure and maintenance of old infrastructure. The Addis Agenda points to an infrastructure gap of US\$ 1 trillion to US\$1.5 trillion annually in developing countries. Estimates of the global gap generally range from US\$3 to US\$% trillion annually. Infrastructure deficits are particularly deep in least developed countries - there exists an infrastructure deficit equating to US\$48 billion in Africa alone. The scope of financing needs makes it imperative to seek an increase in both private and public SDG-related investment (Inter-American Development Bank, 2017). A digital divide still remains, as more than four billion people are without access to the internet, accounting for 57 per cent of the world's population (International Telecommunication Union/UNESCO 2015). The bridging of this divide will significantly progress education and learning, the sharing of knowledge and access to information, and is critical in fostering innovation and entrepreneurship, among other benefits. Infrastructure challenges include urban growth, expanded access for provision of social services including water and health services, and transport links. It is estimated that across many sub-Saharan African countries, reconciling infrastructure deficits and constraints could increase productivity and GDP by as much as 40 per cent (World Economic Forum 2013).

Education is central to meeting industrial and infrastructure requirements for sustainable and inclusive economic growth, influencing capacity for innovation, and laying a foundation for economic diversification and uptake and dissemination of technology.

Development of adequate infrastructure improves access to education and supports hygiene and sanitation, transport, electricity and ICT infrastructure. Industrial growth supports job creation and the need for increasingly specialised skills, which in turn encourage investment in education, and learning and skills development to meet these needs (United Nations Industrial Development Organization 2013). The growth of new industries and ICTs are also significant as half the world now lives in cities. Investing in technological and scientific research and innovation are means through which educational institutions can facilitate sustainable development (UNDP 2016).

As with all SDGs, SDG 9 must be approached within the context of the relevant country, addressing country needs and priorities and socio-economic development challenges. Education must develop capacities in line with sectoral requirements to ensure learners' knowledge and skills for continued or accelerated growth (including in manufacturing activities, extractive industries and agricultural industries) and for development and dissemination of innovation. Effective links between government, education and industry will ensure continued green growth within industry and infrastructure (supporting energy-efficient, low-carbon industrialisation for sustainable growth). Education can further support equitable and sustainable growth through the knowledge

of and ability to implement strategies for inclusive and pro-poor economic development. Focus on skills for enterprise development can similarly support economic diversification and enhanced competitiveness.

As articulated by the Global Partnership for Education (GPE), 'as a country's inhabitants become better educated, they will be more likely to acquire their own critical technical skills and creative problem solving necessary to build and sustain roads and bridges, ICT systems, ports and airports, health and financial systems, governance practices and the many other structures that enable life in a country to improve and flourish' (GPE 2015).

	Knowledge and understanding	Skills and applications	Values and attitudes
ECCE	<ul style="list-style-type: none"> Basic understanding of infrastructure and industries, and how they affect individual lives (e.g. use of public transport to visit family, the industries families work in). Places in the community. 	<ul style="list-style-type: none"> Identification and naming of forms of transport. Ability to identify and describe the purpose of different community places. 	<ul style="list-style-type: none"> Appreciation for personal surroundings. Community involvement.
Primary education	<ul style="list-style-type: none"> Understanding of different types of infrastructure and their uses (e.g. transport, energy, utilities). Concepts of sustainability, industry, economic development, human well-being. Understanding the economic, environmental and social benefits and challenges of different types of infrastructure and industry. Hard (e.g. roadways, buildings) and soft infrastructure (e.g. financial systems, hospitals, schools). Computer literacy. 	<ul style="list-style-type: none"> Ability to identify different community places and their purposes. Ability to identify different sources of energy used in communities. Understanding that sources of energy are not sustainable. Computer skills for research, word processing, etc. Information management. Ability to analyse the benefits and drawbacks of different forms of infrastructure and industry. 	<ul style="list-style-type: none"> Focus on sustainability. Inquisitive. Value well-being and economic resilience. Affordable and equitable access for all. Willingness to explore. Use of experiences to understand theories. Appreciation for provision of public services.
Secondary education	<ul style="list-style-type: none"> Concept of industrialisation, understanding the industrial revolution, problems associated with industrialisation, unequal industrial development and economic growth (e.g. environmental degradation, unequal opportunities and growth). Understanding of benefits and drawbacks of different types of infrastructure (environmental, social and economic implications). Understanding links between industry, economy, GDP and employment. Road safety education. Digital literacy and e-safety. 	<ul style="list-style-type: none"> Transdisciplinary analysis of infrastructure (economic, social and environmental perspectives). Conduct audits on social and industrial infrastructure, considering energy, transport, etc. Ability to critically analyse and make decisions based on holistic assessment. Ability to access information and capacity to pursue livelihood in the green and blue economy. ICT skills and application to other sectors. Ability to analyse infrastructure options. Ability to find and select information. 	<ul style="list-style-type: none"> Developing an awareness/consciousness of the need for sustainability. Equity and inclusivity in economic development. Global mindset. Appreciation for the potential of economic growth to increase quality of life. Awareness of the inequalities and disadvantages of global capitalism. Appreciation for technological capacity to improve well-being and economic development. Advocate inclusive and sustainable industrialisation.

	Knowledge and understanding	Skills and applications	Values and attitudes
TVET	<ul style="list-style-type: none"> Understanding of concepts of sustainable infrastructure and industrialisation, and challenges in achieving sustainability. Knowledge of systemic and sustainable approach to development. An awareness of new opportunities and markets for sustainability innovation, infrastructure and industrial development. Understanding of value chains and markets. Understanding of different regional, national and transborder needs and challenges. Understanding of sustainability, environmental and health standards in industry. 	<ul style="list-style-type: none"> Application of specialised skills to build resilient infrastructures, environmentally sustainable technologies and more sustainable industrialisation. Holistic analysis and application of best practice. Planning and design of sustainable infrastructure and management systems. Entrepreneurship. Development of entrepreneurial opportunities and small-scale industrial services. Development and upgrading of technologies; provision of technical support. Innovation to contribute to sustainable infrastructure and development. 	<ul style="list-style-type: none"> Developing an awareness/consciousness of the need for sustainability. Proactive in mainstreaming of sustainable infrastructure. Resilient and sustainable economic development. Co-operation and capacity building. Greening of industry, infrastructure and service provision. Appreciation for the need for decent work. Awareness of social and environmental impacts of industrialisation and infrastructure choices. Promotion of best practice and upholding industry standards. Corporate responsibility.
Tertiary education	<ul style="list-style-type: none"> Research into innovations to contribute to sustainable infrastructure, development, industrial diversification and mitigating harm from pollution and climate change. The sustainability of transport infrastructure. Understanding of complex economic, social, political, cultural and historic industrial interrelationships (e.g. power dynamics, pollution outsourcing). Education for application of science, technology and innovation in sustainable practices. Development of expertise (e.g. specific economic and infrastructure areas). 	<ul style="list-style-type: none"> Research, technological improvements and innovations. Inform economic decision making (e.g. policy development, industrial diversification options). Promotion of economic, social and environmental arguments for private sector and government to increase research and development, knowledge and technology support. Incorporation of integrative and long-term thinking/planning. Research, innovation and ICT application for solutions to sustainable development challenges. 	<ul style="list-style-type: none"> Campaign for inclusive and sustainable industrialisation. Encourage technological and financial support across countries. Support for increased financial and human contributions for research and development. Engagement with policy-makers and industry leaders.
Adult education	<ul style="list-style-type: none"> Types of infrastructure available in own community (e.g. housing, transport, water and ICT). How local infrastructure impacts on individual lives (pollution, disposal problems, etc.). ICT literacy. Understanding of industries, integration into value chains and markets, and affordable credit. 	<ul style="list-style-type: none"> Conduct an environmental audit of the community in which the learner lives, focusing on social and physical infrastructure and industries. ICT skills and use technology to raise awareness of the SDGs and the need for action. Ability to access information (including work opportunities, affordable credit). 	<ul style="list-style-type: none"> Developing an awareness of the need for sustainability. Entrepreneurship. Act as change makers. Campaign for universal and affordable access to internet.

12. Goal 10 – Reduced Inequalities

Reduce inequality within and among countries

Reducing inequalities is at the core of the 2030 Agenda, and inequality presents a major threat to social and economic development. SDG 10 therefore seeks to reduce inequalities, both within and among countries, that relate to income, age, sex, disability, race, ethnicity, origin, religion, and economic or other status. Targets directly address income growth, inclusive and participatory development, political and regulatory tools, facilitation of migration and mobility, official development assistance (ODA) and international financial flows.

While the MDG era saw significant achievement, it also saw the poorest and most vulnerable people left behind – including unevenness in shared prosperity, persistent gender inequality, inequitable impact of climate change and environmental degradation, and disparities in non-income dimensions, such as lack of access to health and education services, and other assets.

Additionally, while income inequality between countries may have been reduced, inequality within countries has risen. Economic growth is not sufficient to reduce poverty if it is not inclusive.

Many countries have seen income growth among the poorest 40 per cent of the population decline, supported by unequal opportunities in education, health and other services. Extreme poverty is increasingly concentrated in sub-Saharan Africa, with a 25 per cent increase in its share of global poverty since 1990 (World Bank 2016). In developing countries, more than 75 per cent of the population live in societies more unequally distributed today than in the 1990s (World Bank 2016).

Disparities in primary school participation reflect lower female participation – by an average of approximately three per cent across the Commonwealth (Menefee and Bray 2015). Across much of South Asia and sub-Saharan Africa,

children born to mothers with no education are almost three times more likely to die before the age of 5 years than those born to mothers with a secondary education. Girls from the poorest households are twice as likely to marry as children than girls from the wealthiest households. In sub-Saharan Africa, at least 247 million children – or two in three – live in multidimensional poverty, deprived of what they need to survive and develop, and nearly 60 per cent of 20- to 24-year-olds from the poorest fifth of the population have had less than four years of schooling. If current trends continue, by 2030, sub-Saharan Africa will account for nearly half of the 69 million children who will die before their fifth birthday from mostly preventable causes, more than half of the 60 million children of primary school age who will still be out of school, and 9 out of 10 children living in extreme poverty (UNICEF 2015).

Adoption of policy discourse that focuses on inequality and social protection systems is necessary to foster social and economic development and mitigate the impact of shocks on the poor and most vulnerable. Preferential trade treatment for developing countries, and increased ODA and financial flows, can similarly support inclusive and equitable global development. Emerging challenges, such as demographic changes (including ageing populations and youth bulges, and migration), and climate change and other environmental impacts, need to be managed to mitigate impacts and enhance opportunities.

Education is understood as both an essential instrument for equity and a driver of inequality (UNDP 2013). Inequality in access to, participation in, and quality of education fuels growing disparities, and is understood as a condition of inequality later in life, including intergenerational and employment factors. Whilst enrolment rates have grown in developing countries, disparities in enrolment between the poorest and richest children have increased (UNESCO 2015). Social and cultural norms that affect the participation in education of various subgroups persist in many countries,

resulting in the unequal participation of girls and women, people with disabilities and members of minority ethnicities (World Bank 2015).

Education has a big role to play in reducing inequalities, including through the use of ICTs, by building human capacity and ensuring that people at the bottom of the pyramid have the skills necessary to manage their own development.

Education is a powerful tool for communication and empowerment in addressing norms, stereotypes and discrimination. As a tool for empowerment, it can position learners to advocate their own rights and needs, and to become advocates for social justice and inclusive and equitable development. It can similarly drive equality in opportunity, increasing access to employment and providing a foundation for technological absorption, which is also linked to intergenerational transmission and participation

in education and receipt of benefits (UNDP 2014; Vladimirova and Le Blanc 2015). Developing values of shared responsibility, and understanding of international agreements, ODA and financial flows, can develop popular support and accountability to these. Through education, citizens can more fully participate in society and the economy, both to their benefit and to reduce inequalities across society. To this end, countries need to provide universal access to high-quality public education, and prioritise equitable investment to ensure equality for poor and vulnerable groups (Vladimirova and Le Blanc 2015). They also need to bridge existing digital divides, and use ICTs for dissemination of information and knowledge, and as tools to support learning, especially for disadvantaged groups including those living in remote areas, people with special needs, and girls and women.

	Knowledge and understanding	Skills and applications	Values and attitudes
ECCE	<ul style="list-style-type: none"> Use games and role play to introduce notions of inequality, fairness and sharing, e.g. unequal distribution of coins or sweets. 	<ul style="list-style-type: none"> Learn how to interact and communicate positively with others. 	<ul style="list-style-type: none"> Generosity and sharing. Treating others fairly.
Primary education	<ul style="list-style-type: none"> Basic understanding of fairness and equality in the world (e.g. through sport and games as relatable examples). Links between education and inequality – education as both a factor that conditions inequalities later in life (e.g. access to formal jobs) and a powerful instrument for advancing equity, and impact on income. Unpacking stereotypes regarding gender, religion and race. Ratios using inequality statistics, e.g. the number of disabled people in work compared with non-disabled people, or the number of women on boards compared with men. Explore the causes of inequality and its impact on the wider society and economy. Comparison of features of economies in terms of power, equity and justice, in relation to how they impact on national systems, individuals and environments in poor and rich countries. Understand the major policies and programmes that target children and families living in poverty in relevant country. 	<ul style="list-style-type: none"> Application of knowledge to reflect on and analyse real world issues (e.g. factors that may affect a country's participation/success in an Olympic sport). Express views on why a particular inequality is bad and develop solutions for changing the situation. Analyse issues affecting the lives of people in local and global contexts. Analyse differences in living standards in relevant country using census data or government statistics to highlight how quality of life is not the same for everyone. Analyse ethical and non-ethical practices of powerful nations in relation to less powerful nations, indigenous groups and other minorities. Reflect on the moral and ethical implications of policy decisions related to poverty. 	<ul style="list-style-type: none"> Respect for others and diversity. Empathise with people's situations. Value of education as a tool for progress and empowerment. Willingness to take action and advocate equal access to education globally. Empathy and tolerance. Appreciate the feelings of people involved in negative experiences. Engage in meaningful service to the community. Sense of civic responsibility.
Secondary education	<ul style="list-style-type: none"> Understand emerging global economic and environmental practices and their impact on indigenous cultural identity. Understand the legal and political perspectives of indigenous peoples concerning their own social, economic and cultural development. Understand how indigenous peoples throughout the world have maintained the core principles of an indigenous world view (e.g. land stewardship, co-operation, reciprocal relationships such as 'people with people' and 'people with the environment'), or how they have lost their traditional ways of life (e.g. destruction of the rainforest). Inequalities, e.g. apartheid or colonialism, and historical movements to redress these, drawing comparisons with situations around the world today. History of the Commonwealth. Inequality and representation of different social groups/nations in governments and powerful institutions. Migration, population, colonisation, heritage and multiculturalism, and inequalities arising from these. Identities and characteristics. 	<ul style="list-style-type: none"> Application of concepts and knowledge to investigate steps (e.g. resolving land claims, granting indigenous peoples' rights to natural resources) that members of the international community have taken to ensure that indigenous peoples will have a sustainable land base for generations to come. Analyse the various political, economic, and environmental issues that unite indigenous peoples throughout the world (e.g. economic exploitation, preservation of biodiversity). Analyse the meaning of equality. Ability to articulate individual identity. Develop informed opinions about migration, diversity and multiculturalism. Develop strategies to promote social cohesion between different groups. 	<ul style="list-style-type: none"> Respect how indigenous peoples use their cultural practices and traditional teachings when developing new strategies to cope with change and sustain their culture, language and environment. Respect for the struggle and successes that indigenous peoples have had in influencing the policies of national governments and multinational corporations (e.g. land-use policies, partnerships, co-management strategies). Willingness to stand up for the rights of indigenous peoples and minorities and campaign against discriminatory laws. Value personal cultural and natural heritage, and those of others, and recognise how vital these are to happiness and well-being. Cultural pride. Respecting other cultures. Become equality champions. Appreciation of differences and similarities between identities. Appreciation of the benefits of diversity and celebrating difference. Awareness of the Commonwealth.

	Knowledge and understanding	Skills and applications	Values and attitudes
TVET	<ul style="list-style-type: none"> • Use of new technologies such as big data and cloud computing to gain new insights to enhance risk and opportunity analysis. • Cash remittance technologies. • Low-cost, safe and highly accessible remittance services. • Regulation and monitoring of global financial markets. 	<ul style="list-style-type: none"> • Develop strategies to increase access of vulnerable groups to financial services. • Leverage new technologies such as mobile money payment services to create more efficient and effective operating and distribution models for new markets, which extends financial inclusion. • Devise approaches to facilitate basic infrastructure and financial services in rural and peri-urban areas to improve economic opportunities for poor people. 	<ul style="list-style-type: none"> • Willingness to serve disadvantaged communities in a philanthropic manner.
Tertiary education	<ul style="list-style-type: none"> • Links between poverty, child development outcomes and widening inequalities. • Financial education including financial services (innovations in savings, insurance, payments and remittances). • ODA, foreign direct investment and migrant remittances. • Understand the impact of inequalities across income, age, sex, disability, race, ethnicity, origin, religion, and economic or other status. 	<ul style="list-style-type: none"> • Designing, planning, monitoring and evaluation of mechanisms for inequality and data on provision of social services, with regular monitoring of social security coverage. • Develop strategies to remove structural barriers that may prevent people from exercising rights, to build people's capabilities, and to provide them with the capacity to choose. • Audit global positions of power for representativeness. • Develop more inclusive financial markets and transparent, responsible financial services for all. • Develop innovative uses of ODA (e.g. for strengthening leadership in developing countries in managing the diversity of finance and the mobilisation of domestic resources). 	<ul style="list-style-type: none"> • Adopt a rights-based approach to inequality and poverty, viewing people who are poor as rights holders with dignity, aspirations, ambition and the potential to shape their own destiny. • Seek to empower girls and women as entrepreneurs, consumers and managers. • Appreciate that remittances are a key source of financing for sustainable development and relevant to economic inclusivity. • Eliminate discriminatory laws, policies and practices. • Empowerment of migrants and respect for their human rights. • Act as a voice for developing countries in decision making in global international economic and financial institutions.
Adult education	<ul style="list-style-type: none"> • Local governance and decision making. • Micro-credit and micro-finance. • Applying for loans and managing funds. 	<ul style="list-style-type: none"> • Participate in community structures. • Ability to empower children and foster their aspirations. • Navigate financial services. 	<ul style="list-style-type: none"> • Power through participation. • Women's empowerment.

13. Goal 11 – Sustainable Cities and Communities

Make cities and human settlements inclusive, safe and sustainable

By 2030, it is estimated that 60 per cent of the global population will reside in urban areas, reaching nearly 70 per cent by 2050 (UN Department of Economic and Social Affairs Population Division 2014). Whilst the 2030 Agenda accepts urbanisation as being associated with economic growth and potential for reduced poverty, is it also conversely associated with environmental degradation, health risks, slums and stressed capacity of social systems and services. Challenges in access to safe, appropriate, sustainable and affordable housing, basic services, transportation systems, and green and public spaces, and environmental impacts of human settlements, are intensifying as urban populations grow and spatial expansion continues. Complex social, political, environmental and economic dimensions are affecting the inclusiveness, safety, resilience and sustainability of cities and settlements.

Despite attainment of the MDG target for reducing the number of slum dwellers, the overall number of slum dwellers has increased from 1990 baseline levels (World Bank 2016). In sub-Saharan Africa, over 50 per cent of urban populations live in slum conditions (World Bank 2016). Declining air quality in line with urban population growth is increasingly affecting health and stressing health systems, with outdoor air pollution exposure estimated to be responsible for 2.9 million deaths per year (Global Burden of Disease Study 2013 Collaborators 2015). Rapid population growth sees unplanned sprawl, with changing land use and other resulting impacts. The report of the UN Secretary-General on *'Progress towards the Sustainable Development Goals'* (ECOSOC 2016) suggests that every 10 per cent increase in urban sprawl equates to a 5.7 per cent increase in carbon dioxide emissions and a 9.6 per cent increase in per capita hazardous pollution. Without proper planning and management, urban populations will become increasingly vulnerable to

environmental disasters, climate change and other shocks.

Holistic, sustainable urban planning and management are critical for resilient and inclusive cities and human settlements. Reduction of environmental impacts and improvement of the quality of and access to housing, public transport and other services – including water and waste management, energy and energy efficiency, and urban roads and lighting – are fundamental for development of sustainable and inclusive cities and settlements. Planning and management requires a multisectoral, integrated approach across urban, regional and national levels.

Education has an important role to play in fostering individual and collective resilience, and participatory, inclusive development. By understanding the holistic nature of challenges and the dynamic relationships that affect them, individuals can support and drive change. Education can trigger behavioural change for sustainable living. Disaster preparedness education fosters resilience to shocks, including safe practices with regards to water-borne diseases and disasters such as earthquakes and tsunamis that affect cities and human settlements. Understanding of current and future challenges in relation to climate change, potential for mitigation and capacity for adaptation are essential for developing action-oriented and resilient, climate-literate populations (both urban and rural). Development of specialist skills, such as urban planning, sustainable design, disaster management, public health and resource management, help to support internal capacity for sustainable development. Building of knowledge and capacity helps to drive local ownership, and supports development and adoption of creative solutions specific to the local context. As is the case across all of the SDGs, education can shape engaged and socially conscious citizens, motivated and empowered to participate in decision making that affects them, and their local and global communities.

	Knowledge and understanding	Skills and applications	Values and attitudes
ECCE	<ul style="list-style-type: none"> Excursion-based learning with explorations of local urban and natural environments. School gardens and childcare centres to bring nature into urban children's lives. Explore wildlife and green spaces in an urban area. Through field trips and gardening, learn about natural cycles and systems. 	<ul style="list-style-type: none"> Communication skills. Spatial awareness, interest in communications, investigation, constructing things and artistic impressions. Begin to problem solve and be creative (e.g. through participating in an eco-project under adult supervision). 	<ul style="list-style-type: none"> Willingness to take part in new experiences. Sense of belonging in a locality. Collaborative learning. Treats people and nature fairly and with kindness. Collaborative resourcefulness. Show empathy toward other people and nature.
Primary education	<ul style="list-style-type: none"> The nature and components of cities and our basic needs; food, housing, energy, transport and water. Understanding of warnings and disaster preparedness. Ways in which green spaces and nature are integrated in the community. Participatory design of city parks, playgrounds, large-scale public spaces, open space. Local ecosystems and accessible examples of sustainable lifestyles. Investigation of the urban environment, urban design and planning. Urban environmental education. DRR and management. 	<ul style="list-style-type: none"> Ability to care for parts of cities and human settlements (e.g. starting a community vegetable garden). Collaborative learning and engagement. Multicultural nature of cities/towns. Innovations for urban environments. Disaster preparedness. 	<ul style="list-style-type: none"> Awareness of the importance of sustaining the natural environment. Creative self-expression. Application of diversity. Environmental consciousness. Appreciation of safe spaces and security.
Secondary education	<ul style="list-style-type: none"> Understanding of living spaces and shelter, including functions of living spaces, and how spaces and shelter meet individual and family needs. Different forms of shelter for individual and family needs and functions. Basic human needs and how they are addressed in local urban, peri-urban and rural settlements. Changing urban environments, causes of urbanisation and its pros and cons. Recycling and waste management. Benefits of green spaces in community engagement. 	<ul style="list-style-type: none"> Analysis of energy-efficient housing to meet people's financial needs, as well as environmentally friendly building practices. Able to contextualise human needs within the needs of the greater surrounding ecosystems. Ability to dispose of waste in a responsible manner and recycle. Understanding of social realities related to living spaces in the relevant country, and in other countries and regions. Design and maintenance of community green spaces. 	<ul style="list-style-type: none"> Interest in and responsibility for protecting the environment. Empowered to debate against decisions that lead to unsustainable human settlements. Responsible consumer attitude to mitigate water and air pollution. Express opinions on the urban environment or the locality.

	Knowledge and understanding	Skills and applications	Values and attitudes
TVET	<ul style="list-style-type: none"> Urban v. rural lifestyles. Spatial planning, planning theory and city planning. Architectural design including design innovation and design at times of social change. Design of roof lights that can separate light and heat. Self-built rentable housing. Environmentally responsive and responsible design in architecture. Management of waste and general pollution. Urban green infrastructure and stormwater management. Human and physical processes that shape urban ecologies and environments. 	<ul style="list-style-type: none"> Sustainable design and urbanisation. Master management of waste for efficiency and technological growth to minimise the use of resource and energy. Create affordable, sustainable, safe housing that harmonises with the surrounding environment. Evaluate the sustainability of the work environment. Identify environmental strengths of the work environment and areas where change may be effective. Evaluate how families are affected by new trends in household technologies. 	<ul style="list-style-type: none"> Appreciate safe, green spaces and their integral place in well-being. Motivated to restore natural environment to create buffer zones around built communities. Foster 'culture change' by engaging in alternative entrepreneurial initiatives. Motivated to engage in recycling industry.
	<ul style="list-style-type: none"> Urban agriculture and local food systems. Principles of permaculture. Contextual TVET to address rapid growth of cities in the developing world, coupled with increasing rural-to-urban migration. 	<ul style="list-style-type: none"> Apply concepts related to environmental sustainability in the workplace. Equipment maintenance and repair, and understanding technological change. Attention to the repair and recycling of modular components. 	<ul style="list-style-type: none"> Resilience and sustainability. Integration opportunities that mitigate urban violence. Adopt a sustainable system approach that does not deplete resources or damage the environment.
	<ul style="list-style-type: none"> Urban ecology, waste management, green design, climate change, urban planning, parklands, water systems, environmental justice and ecological restoration. Climate change and cities, and climate justice. TVET programmes aimed at slum dwellers. 	<ul style="list-style-type: none"> Regulate urban ecology, human activities in cities and associated water, energy, and chemical fluxes within city boundaries (e.g. vertical carbon fluxes in urban forests) or across rural-to-urban gradients. 	<ul style="list-style-type: none"> Consciousness of the need to protect the environment balanced with sustainable housing.
Tertiary education	<ul style="list-style-type: none"> Sustainable energy for cities including residential thermal-energy research, improving efficiency for schools and use of solar water heating. Technical environmental science. 	<ul style="list-style-type: none"> Incorporate a range of sustainable technologies and techniques that would maintain a growing urban population. 	<ul style="list-style-type: none"> Preserve unique urban cultures against a backdrop of globalisation and the homogenisation of city life. Reconnect with, value and restore the natural environment.
	<ul style="list-style-type: none"> Infrastructure and sustainable human settlements including use of green open spaces for urban resilience, spatial planning and infrastructure design. 	<ul style="list-style-type: none"> Plan resilient housing (especially in areas that are at risk from flooding) and address carbon emissions mitigation. Apply innovative urban governance. 	<ul style="list-style-type: none"> Appreciate how social norms and pressures (e.g. demographic change) affect spaces and shelter requirements, and commit to providing shelter for everyone.
	<ul style="list-style-type: none"> Urban networks, governance system development, climate services for adaptation and mitigation, green and safe transport systems and fresh water supply. 	<ul style="list-style-type: none"> Adapt and use existing urban spaces to provide food and employment for inner city areas. Build urban climate change resilience. 	<ul style="list-style-type: none"> Develop local responses to local issues. Tackle social exclusion. Appreciate and respect the diversity of cultures in urban settings.

Adult education	Knowledge and understanding	Skills and applications	Values and attitudes
	<ul style="list-style-type: none"> • Sustainable construction and construction management, with a focus on gender concerns. • Climate change and its impact on human settlements. • Laws and regulations concerning zoning, pollution, ownership and maintenance of property, building and development, expropriation and conservation of energy. 	<ul style="list-style-type: none"> • Use vacant lots and open spaces to create (rooftop and vertical) gardens with plants and animals. • Enhance personal and local spaces using environmentally friendly materials (e.g. by creating household accessories using recycled materials or second-hand purchases). • Ability to adapt to a rapidly changing living environment. 	<ul style="list-style-type: none"> • Consider impact on environment when acquiring shelter and designing living spaces. • Critically evaluate needs throughout the stages of life, with regard to cultural traditions, economic and human resources, and energy costs and utilisation. • A strong sense of community. • Engage in decision-making processes that affect the environment and habitat.

14. Goal 12 – Responsible Consumption and Production

Ensure sustainable consumption and production patterns

'Education can make a critical difference to production patterns and to consumer understanding of more sustainably produced goods and prevention of waste.'

(UNESCO 2016)

Growing populations and resource-intensive lifestyles are increasingly contributing to resource exhaustion and environmental stress. It is estimated that if the population reaches 9.6 billion by 2050, sustaining current natural-resource demand would require three times the earth's capacity (UN 2015). Agricultural irrigation currently accounts for 70 per cent of human freshwater demand, while waterways are being polluted at a faster rate than the hydrological cycle can recycle and purify (UN 2015). Additional pollution sources include the near doubling of per capita hazardous waste production between the late 1990s and late 2000s (World Bank 2016). With regards to energy use, transport is the largest energy user, followed closely by commercial and residential use, while roughly only one fifth of energy is sourced from renewable sources.

A study by the Food and Agriculture Organization of the United Nations (FAO) suggests that roughly one third of food produced globally is wasted or lost at some point in the supply chain, which runs from agricultural production through to household consumption. The highest levels of consumer waste are found in developed countries, with per capita food waste in Europe and North America estimated to be roughly 95–115 kilograms per year, while in sub-Saharan Africa, South Asia and Southeast Asia it is 6–11 kilograms per year (FAO 2011). Food wastage occurs not only through the food lost but also in the form of lost resources (including land, water and chemicals) and generated

greenhouse gas emissions (including fertilisers, production and transport energy). Reduction in food loss could have a significant impact on food security, for farmers through to end consumers, and food wastage exemplifies the need for SDG 12.

Sustainable production and consumption (SPC) requires a paradigm shift for the adoption of sustainable lifestyles and support for resource-efficient and low-carbon development. A transition towards a low-carbon, green economy calls for environmental integrity and sustainable resource use, and can lead to improved quality of life and employment opportunities.

Change is needed across the entire supply chain and product lifecycle. Education of all stakeholders is critical for informed decision making and widespread behavioural change. Improved understanding of environmental and social impacts, including intergenerational, biodiversity, climate and health effects, and the benefits of altered production and consumption, is needed. Raising awareness among producers, industries, retailers and consumers will support responsible decision making, and demand for SPC.

Individuals can learn how to make sustainable lifestyles choices, including waste reduction, reusing and repurposing of materials, and recycling, as well as informed and sustainable purchasing choices that do not place a burden on the environment. According to UNESCO (2016), education increases the likelihood of adoption of energy and water efficiency, and household waste recycling.

Consumers and retailers have the ability to prompt industry adoption of sustainability practices, and to drive new sustainability-related industries and services. Education can empower support for and engagement with government and the private sector to adopt and enforce or implement environmental regulations, and for the removal of fossil-fuel subsidies in line with Target 12.c ('Rationalize inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation

and phasing out those harmful subsidies, where they exist, to reflect their environmental impact, taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities.').

Equally, businesses have the potential to enable and inspire consumers and influence buying choices through the adoption and marketing of sustainable practices and products. They can also promote skills development to design solutions for sustainable lifestyles and reduced impacts on the environment; this includes on-the-job training and continuous learning, as well as partnerships with government and education institutions.

A better understanding of environmental and social impacts of products and services is needed, both of product life cycles and how these are affected by lifestyles choices. Target 12.8 aims

to ensure that, by 2030, 'people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature'. A means of achieving this target is through formal, non-formal and informal educational curricula on sustainable development and lifestyles.

Education can provide learners with the knowledge and skills to implement sustainable practices and techniques (both at home and at work), use monitoring and accountability mechanisms (including corporate sustainability reporting), and foster innovation. Development of 'green skills' is essential in transitioning to SPC patterns, with significant potential for job-based training and collaboration with both the private and public sectors. Increased access to information supports the uptake and capacity to move towards SPC, including the sourcing and application of financial and technical assistance mechanisms.

	Knowledge and understanding	Skills and applications	Values and attitudes
ECCE	<ul style="list-style-type: none"> Introduction of reduce, reuse, recycle, recover ('4 Rs'). Water and energy use. Material cycles and environmental impact of wastes. Experiential learning. Engage in family decisions on what to buy. 	<ul style="list-style-type: none"> Application of '4 Rs' (e.g. reusing boxes or plastic bottles during play). Analysis of where waste goes (landfill, water). Water conservation (e.g. turn off taps). 	<ul style="list-style-type: none"> Good habits regarding waste, water and energy use. Ecosystem awareness, pollution avoidance.
Primary education	<ul style="list-style-type: none"> Sustainable and unsustainable consumption, including resource use, waste generation and disposal, and environmental and health impacts. Further understanding of the '4 Rs': Identify examples of irresponsible and unsustainable consumption and production, both locally and globally. Understand impact of consumptive choices (e.g. diet). Participatory learning. Explore how technology can be harnessed and used to support responsible consumption and production. Calculate and compare Ecological Footprints. 	<ul style="list-style-type: none"> Making a case and developing an argument. Distinguishing between and analysing consumer impacts and risks of different choices (e.g. discovering what products are made of, decomposition times, where waste goes). Participating in recycling, composting and other environmental schemes. 	<ul style="list-style-type: none"> Sense of agency, participatory capacity. Appreciation of the need to reduce harm, of impact and of finite resources. Adoption of non-wasteful behaviours (e.g. reduce packaging, use compost, seek environmentally friendly options). Awareness of environmental/health risks, and benefits of safe disposal.
Secondary education	<ul style="list-style-type: none"> Understand impact of consumptive choices (e.g. diet). Participatory learning. Explore how technology can be harnessed and used to support responsible consumption and production. Calculate and compare Ecological Footprints. The global environment: how consumer choices and attitudes affect economies and people in other countries. Understanding of global standards of products, services and processes. Efficiency of production systems, potential for low-impact production. Supply chain analysis and fair trade. Causes and examples of unsustainable social trends and irresponsible consumption and production. Positive and negative impacts of technology on consumption and production. 	<ul style="list-style-type: none"> Analyse carbon and methane impacts of diet and food purchasing behaviour. Food chain analysis (e.g. family food purchasing behaviour and impacts). Understand the challenges facing the planet and the need for more responsible consumption and production patterns. Understand how fast resources are consumed and waste is generated. Understand environmental concerns and considerations related to globalisation, and able to assess effects of current trends. Application of International Organization for Standardisation (ISO) standards. Analyse and interpret statistics. Understand supply chain certification, eco-labelling. Identify strategies/principles for sustainability. 	<ul style="list-style-type: none"> Informed purchasing (product lifecycle implications). Consumer awareness and commitment to sustainable choices. Prepared to take action to bring about change and reduce the Ecological Footprints. Global citizen. Awareness of reverberating impacts of production and consumption choices. Appreciation for whole supply chain, work conditions, need for decent work. Raise awareness about the need for more responsible approaches to the use and production of technologies.

	Knowledge and understanding	Skills and applications	Values and attitudes
TVET	<ul style="list-style-type: none"> Understand 'decoupling' of economic growth from environmental impact, and production patterns. Food lifecycle – processing, engineering, energy use, etc. 	<ul style="list-style-type: none"> Research and identify opportunities within production and consumption for improved environmental impact. Identify influences on buying decisions, and how to influence sustainable choices. 	<ul style="list-style-type: none"> Responsible consumerism. Awareness of links between consumer behaviour and environmental impacts. Proactive in fostering widespread shift towards sustainable production and consumption.
Tertiary education	<ul style="list-style-type: none"> Waste minimisation methods and technologies, conservation and ecosystem health, ecological footprint reduction. Eco-audit and EMAS (Eco-Management and Audit Scheme). Circular economy: remanufacturing, repair, reuse, recycle (including recovery of materials into product design). Political economy of production and consumption, policies involved, corporate and consumer responsibility. Dynamics of transition at different scales, resilience and capability, options for greening the developmental phase, technological innovation for sustainable socio-ecological systems, and social learning for sustainability. Management of shared natural resources, including disposal of toxic waste and pollutants. 	<ul style="list-style-type: none"> Advanced product design skills to facilitate resource recovery and reuse. Analyse ecological footprint associated with different products and with consumer choices. Ability to analyse ecosystem effects and impacts of production and management systems. 	<ul style="list-style-type: none"> Driven to change wider consumption patterns, and address unsustainable consumer choices. Heightened awareness of responsible consumerism, involving consideration of factors related to the environment (e.g. in development/production of goods, environmental impact/energy efficiency of products/ services).
Adult Education	<ul style="list-style-type: none"> Environmental, social and economic impact of unsustainable production and consumption choices. Understanding of how to integrate the '4 Rs' into daily living and livelihood generation. 	<ul style="list-style-type: none"> Understanding of different scales of decision making or multilevel governance. Planning and design of corporate social responsibility strategies. Research into adaptation, innovation and resilience. Analyse production and consumption practices for sustainable planning. 	<ul style="list-style-type: none"> Appreciation of need to take decisions and co-ordinate resources at the right scale – subsidiarity. Greening of business and government. Importance of addressing interconnections between environment, society and economy to produce holistically sustainable systems. Appreciation of sustainable business models and lifestyles.
		<ul style="list-style-type: none"> Ability to make consumer choices based on sustainable principles. Ability to engage with others about sustainable lifestyles and community living. Incorporation of sustainable choices into livelihood generation. 	<ul style="list-style-type: none"> Intrinsic value of the environment, and adoption of conservation-oriented behaviour. Awareness of responsible consumerism, and commitment to sustainable choices.

15. Goal 13 – Climate Action

Take urgent action to combat climate change and its impacts

Climate change has had a significant impact on human lives all over the world, with many severe consequences such as melting ice, rising sea levels, heat waves, an increase in the number, duration and intensity of tropical storms and droughts, and alarming global warming. The most vulnerable groups include the urban poor, the elderly and children, traditional societies, subsistence farmers and those living on the coast (Confalonieri et al. 2007).

Small states make up approximately 60 per cent of Commonwealth member countries and are disproportionately affected by climate change, despite being some of the lowest contributors. It is projected that, by mid-century, small states will not be able to meet water demand during low rainfall periods (Intergovernmental Panel on Climate Change 2007) – a situation compounded by the effects of changes in air and sea surface temperature, rainfall, sea-level rise and extreme weather events on island environments, economies and people. Many small states are predicted to suffer greatly due to rising sea levels and it is likely that Kiribati will disappear within the next 30–60 years (Displacement Solutions and UN Environment Programme 2015).

Climate change threatens to reverse development progress, unless concerted efforts are made to make development climate resilient. As such, it is essential to build adaptive capacity, resilience to change and effective solutions. Interventions need to be developed for the mitigation of and adaptation to climate change, to minimise impact and ensure resilience. To mitigate impact, immediate action is required. Further, impacts are cumulative over time and will disproportionately impact future generations. Education is integral to any strategy to create a resilient generation who will advocate action and be resilient to change.

Due to the non-discriminatory and wide-ranging impacts of climate change, education has a crucial role to play in raising awareness about the urgency of addressing climate change, including ways to be more energy efficient. Formal, non-formal

and informal education systems are essential to educate citizens of all ages. For the youngest and future generations who will be most impacted by climate change, positive influences during the stages of an individual's early life can contribute to a society that is equipped with the understanding, values, knowledge and skills to tackle the causes and impact of climate change.

It is vital that countries develop policies and strategies to build resilience against climate change, and education is key to this. It is a matter not only of mitigating the effects of climate change but also of addressing, through educational resources, adaptation measures that are country specific. Education for climate change should integrate information on key climate change-related subjects, as well as practical measures of mitigation and adaptation that can be utilised at home and at work. Education develops resilience skills to prepare for the challenges of climate change, and provides opportunities for learners to apply their knowledge to real-life situations. Public training and availability of resources (such as toolkits for local communities) are critical in building community resilience. Innovative communication strategies, involving various media sources including posters, radio and television, are essential for wider public education. Access to resources and training is similarly important for greenhouse gas-intensive industries, to gradually enhance climate change adaptation and to build an ecologically solid economy.

Curricula at all stages of learning need to be compiled with respect to green skills, with an emphasis on up-to-date technologies aimed at saving energy and environmental protection. Ecologically sound economies and the green economy require a highly skilled workforce supplied by high-quality vocational education and training systems (Diep and Hartmann 2016). Tertiary institutions also have a major role to play in weighing the implications of climate change for wider societal development, and leading research to transition to low-carbon, more sustainable and energy-efficient futures. Social science research programmes can bring an understanding of how people experience climate risk and how this shapes their identities, social practices and societal relations. It also calls for the documentation and valuing, studying

and understanding of traditional and indigenous knowledge, and research to understand its potential contribution to adaptation and mitigation.

Additionally, curricula should reflect the needs of the communities in which they are used. To ensure

contextualised curricula, teachers and community members are a key resource in combining recognition of local contexts and traditional knowledge with the promise of new technologies and globally shared learning resources.

	Knowledge and understanding	Skills and applications	Values and attitudes
ECCE	<ul style="list-style-type: none"> Learn about emergency preparedness, evacuation drills and first aid. Understanding of nature through forest/nature classes. 	<ul style="list-style-type: none"> Emergency preparedness. Analysis for understanding of and concern for the environment. Gardening and plant-growing skills. 	<ul style="list-style-type: none"> Awareness of nature. Curiosity about the world. Keeness to investigate. Open-mindedness.
Primary education	<ul style="list-style-type: none"> Understanding of and preparedness for natural disasters (e.g. floods, tsunamis, earthquakes). Basic understanding of climate science (e.g. carbon cycles, greenhouse gas effects) and physical impacts (e.g. sea-level rise, extreme weather). Foundation in economic, environmental and social concepts of climate change, and how it relates to human lives (e.g. health, energy, food production). Exploration of traditional/indigenous knowledge and culture. Concepts of climate mitigation and adaptation, resilience, sustainable development. 	<ul style="list-style-type: none"> Natural-disaster preparedness. Ability to describe the causes and effects of climate change. Understand and distinguish climate change impact in relation to self/context. Analyse impacts and vulnerability in key sectors due to climate change. Impact analysis (e.g. interpret maps, graphs and statistics) across spatial and temporal scales. Understanding issues of equity and climate justice. Differentiate between adaptation and mitigation measures, and employ creative solution-finding skills. 	<ul style="list-style-type: none"> Awareness of the impacts of human activities and consequences of personal actions. Concern for and responsibility for living organisms and their environment. Motivation to make informed decisions and take responsible action. Awareness of different impacts (e.g. geographic, socio-economic). Global citizenship. Appreciation of traditional cultures.
Secondary education	<ul style="list-style-type: none"> Intermediate understanding of climate science, climate justice and international co-operation/agreements. Integrative concepts and methods, including economic-environmental, economic-social and social-environmental interactions. Integration of systems through examples such as carbon trading (economic/environmental), and human capital (economic/social). Implications of inaction on climate change (economic, social and environmental), and understanding of impacts and vulnerabilities. Understanding mitigation and adaptation. 	<ul style="list-style-type: none"> Problem-based learning. Adaptive learning and self-reflection. Critical thinking. Linkage of theory and practice. Adaptation planning skills. Use of carbon footprint to understand ways to reduce greenhouse gas emissions. Complex analysis (e.g. link between rising sea levels, agricultural capacities, soil and water quality, flood risk, coastal habitat loss, tourism, etc.). Skills to monitor the environment and analyse results to take action. Assessment and development of solutions. 	<ul style="list-style-type: none"> Environmentally active and responsible citizens. Behavioural change for mitigation. Informed use and consumption to reduce CO2 emissions, recycle, use less electricity, etc. Appreciation of importance of a sustainable ecosystem. Green entrepreneurs. Commitment to climate justice, and addressing inequitable impacts. Reflexivity. Individual and collective action.

	Knowledge and understanding	Skills and applications	Values and attitudes
TNET	<ul style="list-style-type: none"> Understanding of climate and environment including human influence, environmental degradation, vulnerability, and interrelationship between human actions, climate change and secondary effects. Integrated assessment of the economic, environmental and social aspects of issues. Intergenerational and future dimensions. Green and blue economy. Understanding of climate change and agriculture/food supply, marine resources, energy production/consumption, etc. Mitigation and adaptation solutions. 	<ul style="list-style-type: none"> Workplace skills, e.g. ocean management, green-economy planning, energy and natural resources management, energy technology skills (e.g. installation of solar water-heating systems), Develop possible adaptation and mitigation strategies for communities. Systems innovation skills. Holistic approaches to climate change and climate-compatible development. Connection of local actions with global processes. Integrate current and future climate risks into planning and practice. 	<ul style="list-style-type: none"> Awareness raising and communication. Solutions-oriented. Corporate responsibility. Committed to sustainable production and consumption. Society, economy and environment are seen as interacting in an interrelated system. Climate-compatible focus.
Tertiary education	<ul style="list-style-type: none"> Research on governance, participation and social-ecological system change to inform policies on climate change, and the development of institutions for adaptation and mitigation, as well as for systemic integration of climate change. Research on adaptive and integrated governance systems to operate across multiple scales, including co-management and transboundary management arrangements for collective management of natural resources. Population, urbanisation, migration and conflict. Climate-resilient pathways. Expertise, understanding complexities, specialised research (e.g. gender-related vulnerabilities, impact and management of climate-related diseases). Research on social change and social vulnerability aspects of climate change. Climate and impact projections. Research on limits to adaptation and transformational approaches to adaptation. Understanding of various technological/economic models, including industrial ecology, agroecology, ecological engineering and social enterprise. 	<ul style="list-style-type: none"> Research to identify innovative and creative approaches to enhance national and regional responses to climate change. Climate-resilient pathways to development. Research for strengthened knowledge base and addressing gaps. Integrated research, and development of holistic approaches to sustainable development. Cross-scale, integral systems thinking. Capacity for dealing with complexity (e.g. inequitable impacts). Climate modelling, scenario building and methodological development for adaptation. Understanding and assessments of risks, impacts and vulnerability aspects. Understanding of social, cultural, economic and political dynamics and influences on social practices and society. Strengthening of climate information and climate services through knowledge and research, including modelling, downscaling and scenario development. Capacities to access and manage climate finance. Ability to create linkages between various technologies/economic models. 	<ul style="list-style-type: none"> Proactive engagement, and advocating open and transparent governance. Climate compatible and responsive development. Awareness raising; generating interest and developing capacity. Systemic, integrated perspectives on global change and climate-compatible development concerns. Need for collective action; mobilisation for wider change, greater resilience and improved quality of life. Climate ethics. Changes in social practice and habits, which in turn require new values and ethics, learning, social innovation and social learning. Ethical leadership in decision making. Appreciation for technologies/economic models in climate change.
Adult education	<ul style="list-style-type: none"> Impact of climate change on humans, including vulnerabilities and multiplier effect. Role of indigenous/traditional knowledge in scientific and social processes (e.g. agricultural practices, forecasting techniques). Understanding of processes of social and cultural change associated with climate change. Concepts of climate mitigation and adaptation, resilience, sustainable development, and sustainable livelihoods. 	<ul style="list-style-type: none"> Community-based climate change preparedness in coastal communities. Community research and outreach. Understanding of the role of climate ethics in decision making. Skills as to how to use climate change information. Use of indigenous/traditional knowledge to address climate change. Capacity to pursue sustainable livelihoods. 	<ul style="list-style-type: none"> Support awareness raising. Focus on building individual and community resilience. Commitment to sustainable livelihoods. Responsibility to take action. Positive role of local and traditional knowledge in building resilience to climate change. Behavioural and lifestyle changes for climate change actions. Campaign for climate justice.

16. Goal 14 – Life below Water

Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Marine ecosystem health and marine resources are important for economic sustainability, food security, and social and cultural value. As a food source, fish account for the main protein source of more than one billion people, with average worldwide fish consumption estimated annually to be 20 kilograms per person (World Bank 2016). Fisheries also represent a significant economic activity in many economies, including many small island developing states and countries in sub-Saharan Africa (Kelleher 2008). Marine pollution goes beyond geographic boundaries and affects fisheries, causing further transboundary concerns. Conservative estimates of the global market place the value of marine and coastal resources at US\$2.4 trillion per year, including fisheries and aquaculture, tourism and maritime transport, resource extraction, ocean-based renewable energy and marine biotechnology (Roberts and Ali 2016). Marine and coastal ecosystems health is also critical to various ecological processes, including weather and climate regulation, as a global carbon store and for the hydrological cycle. Targets therefore include ending illegal fishing, addressing the impacts of climate change on the oceans and reducing marine pollution.

These issues have major ecological and economic costs. According to UNDP, the impacts from overfishing, coastal hypoxia and eutrophication, invasive aquatic species, coastal habitat loss and ocean acidification cost the global economy at least US\$350–940 billion every year (UNDP 2013).

Integrated coastal management is one proven approach to successfully co-ordinating various coastal and marine management efforts, addressing the governance of human activities affecting the sustainable use of goods and services generated by coastal and marine ecosystems.

While the oceans represent a critical resource, ecosystem degradation and overextraction represent a significant risk to sustainable development, requiring issues to be addressed.

Impacts from human activities are wide-ranging, and include: invasive species introduction, shipping-related pollution (e.g. ballast water release, toxic anti-foulants), terrestrial pollution run-off, climate change effects (including ocean acidification), habitat destruction, and depleted fish stocks and endangered species. The FAO has assessed 34 per cent of global fish stocks as being fished at biologically unsustainable levels (i.e. overfished), and 58.1 per cent as being 'fully fished', with no potential for sustainably increased production (FAO 2016). Marine ecosystem degradation affects not only ecological processes and biodiversity but also subsequently public health and social and commercial use of marine resources. It also puts sustainable development in jeopardy. Emerging and intensifying challenges such as those related to climate change and emerging industries (e.g. deep-sea mineral extraction) will put stress on an already vulnerable system.

Sustainable ocean conservation and resource management are needed to support sustainable economies, aquatic habitats and biodiversity, for which education is essential.

Capacity-building programmes should be tailored to the needs of different regions and aimed at human resource development, knowledge transfer and the strengthening of institutional capacity in the law of the sea and marine affairs, including planning, management and monitoring capacities. Curricula should support the development of marine technologies and increase citizen engagement. Dedicated ocean-related curricula should be an essential part of education for sustainable development to raise public awareness and change consumer behaviour. Curricula can also facilitate cross-sectoral and integrated approaches, and develop awareness and decision-making processes to address the full range of multiple-use issues related to oceans and coasts.

Education plays a key role in supporting the transition towards sustainable marine resource use and conservation. An understanding of marine ecology principles and management provides a foundation for consensus-building and long-term sustainable use. With the development of critical evaluation skills, learners are able to evaluate

marine ecological information for management and to understand the broader ecological, social and economic consequences of human activities (including cumulative effects and feedback loops). Learners can acquire knowledge and be empowered to develop relevant and sustainable management and conservation solutions, including science-based management and sustainable tourism practices. The ability to communicate effectively with regards to marine-related issues, and to engage in dialogue, is essential for consensus building and development of solutions.

Furthermore, developing respect for the value of healthy ecosystems, the services these provide and their interconnections with human life, will help people to respect and advocate coastal and marine conservation areas and environmental regulations.

Education can also help to build expertise and technical capacity for a workforce with the appropriate skills for blue economy development, and support increased internal regulatory and enforcement capacity.

	Knowledge and understanding	Skills and applications	Values and attitudes
ECCE	<ul style="list-style-type: none"> Learn about what an ocean is and the creatures that live in it. Learn about beach and inshore marine habitats or freshwater resources, and identify the objects (e.g. seashells) that can be found in them. 	<ul style="list-style-type: none"> Learn how to make items and artefacts from beach-found objects, and make and care for aquariums using seashells, goldfish and seaweed. Learn how to swim and be confident in the ocean environment. 	<ul style="list-style-type: none"> Awareness and appreciation of, and respect for, the environment and nature, oceans and marine life, and the need to care for these resources.
Primary education	<ul style="list-style-type: none"> Introduction to understanding the role of the ocean (e.g. moderating climate, providing oxygen and food, medicine, energy and minerals). Introduction to ocean zones, and marine plants and animals, their habitats and behaviours. Knowledge of ocean animals and adaptation. Introduction to recognising the global context of challenges for local fisheries and how this affects fishermen's livelihoods. 	<ul style="list-style-type: none"> Application of critical thinking skills to investigate threatened or endangered species, and conducting surveys or interviews with fishermen and fish processors to develop potential solutions to the challenges faced. Application of concepts to investigate how ocean animals adapt to certain parts of their environment to develop potential solutions on how to protect oceans. 	<ul style="list-style-type: none"> Awareness and appreciation of, and respect for, the environment and nature, oceans and marine life, their fruitfulness and the need to care for these resources. Show concern and responsibility for living organisms and their environment, including endangered species. Awareness and behavioural change towards more sustainable practices during daily life.
Secondary education	<ul style="list-style-type: none"> Further understanding of the role of the ocean (e.g. in origins of earth materials, biogeochemical cycles), and knowledge of marine and coastal ecosystems and biodiversity. Knowledge of the impact of humans on the ocean, marine pollution and marine disasters, and how these can be mitigated (e.g. through international law). Understand the economic potential of marine resources and the blue economy. Developing an understanding of the need for technology and innovation for the transfer of marine technology. Knowledge of different types of fishing and the livelihoods they support. Introduction to understanding the sustainable management of oceans, seas and marine resources. Awareness of the careers relating to ocean, sea and marine resource management. 	<ul style="list-style-type: none"> Application of critical thinking skills to conduct research into real-world challenges for the sustainable use of oceans, seas and marine resources, including primary and secondary research methods (e.g. natural marine disasters, oil spills, overfishing of cod in the Atlantic and destruction of coral reefs through unsustainable fishing and tourism practices), and develop practical solutions. Ability to raise awareness and participate in community engagement (e.g. running campaigns for fishing practices and fisheries as a renewable resource, and conducting beach clean-ups). Application of concepts to developing potential solutions for technology gaps. 	<ul style="list-style-type: none"> Awareness and appreciation of, and respect for, the environment and nature, oceans and marine life, their fruitfulness and the need for the sustainable management of the marine and coastal ecosystem. A sense of social responsibility and foundations to take individual and collective responsibility for oceans, seas and marine resources. Utilisation of sustainable practices, and the encouragement of that in others. Awareness of the value of marine resources left in the sea as opposed to extracted from it, and the finite nature of resources. Value the need for regulations to protect marine resources and act to help protect them. Understand traditional ways of life in fishing communities; value traditional knowledge.
TVET	<ul style="list-style-type: none"> Understanding of economics and business management to support local business, e.g. fisheries. Training in the sustainable management of oceans, seas and marine resources, and marine and coastal ecosystems. Knowledge of strategies for realising the economic potential of marine resources while using sustainable practices. Understanding of research methods and techniques for research and development into technology and innovation for the transfer of marine technology. 	<ul style="list-style-type: none"> Ability to develop business plans for local businesses, which take into account the need for sustainability. Development of technical skills for the work place, e.g. sustainable ocean management, green technology and energy. 	<ul style="list-style-type: none"> Commitment to the sustainable management of oceans, seas and marine resources, and marine and coastal ecosystems, and the use of green technology and energy. Value the blue economy model for sustainable development. Value the production of living aquatic resources for food and materials, and the importance of the fisheries sector.

	Knowledge and understanding	Skills and applications	Values and attitudes
Tertiary education	<ul style="list-style-type: none"> Detailed knowledge of ocean science including the ocean's role in climate change, and the effect of climate change on the marine ecosystem. Complex understanding of how to ensure sustainable management of marine natural resources, particularly fisheries, including introduction of marine reserves/locally managed marine areas. Strategies to conduct financial and natural science, and engineering assessments for marine renewable energy. In-depth research into technology and innovation for the transfer of marine technology. 	<ul style="list-style-type: none"> Ability to undertake climate-proofing research, especially in relation to fisheries and water infrastructure. Ability to develop strategies and techniques to sustainably manage marine natural resources. Investigate natural resources from the marine environment, including fish; understand the impact of continued fishing on resource availability; gather, analyse and interpret data. Complex research, development and innovation skills with the ability to produce solutions and proposals with respect to marine renewable energy and technology transfer. 	<ul style="list-style-type: none"> Commitment to the sustainable management of oceans, seas and marine resources, and marine and coastal ecosystems, and the use of green technology and energy. Value sustainable production and consumption, and the blue economy model. Respect and encourage moral, legal and ethical values in ocean governance. Appreciate the benefits of sustainably managed marine reserves and areas.
Adult education	<ul style="list-style-type: none"> Training on natural resource management (particularly targeted at rural communities, women's groups and coastal communities). Training on the prevention and mitigation of overexploitation, and on sustainable cultivating and harvesting practices. Training on ocean, sea and marine resource management plans, and regulations for harvesting of natural resources and for ecotourism. 	<ul style="list-style-type: none"> Ability to take part in environmental decision making and conservation. Application of knowledge to utilise sustainable practice, ecotourism, and ocean, sea and marine resource management. Utilise practices to become a profitable business and provide better income opportunities for rural and coastal communities. 	<ul style="list-style-type: none"> Value sustainable production and consumption, and the blue economy model Motivated to influence environmental decision making. Willingness to utilise innovative practices to support the sustainable management of oceans, seas and marine resources, and marine and coastal ecosystems.

17. Goal 15 – Life on Land

Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat deforestation, and halt and reverse land degradation and halt biodiversity loss

Healthy terrestrial ecosystems are integral to human survival, well-being and prosperity. Conversely, human activities, including human-induced climate change, are profoundly affecting the environment, leading to widespread biodiversity loss, deforestation and desertification, among other impacts.

Roughly 30 per cent of earth's land is covered by forest, but this is decreasing. The period from 1990 to 2015 saw a 3 per cent loss in global forest coverage, accounting for more than 129 million hectares (World Bank 2016). It is estimated that roughly 20 per cent of the global population is dependent on forest ecosystems for livelihood production, while 80 per cent of terrestrial species live within forest habitats (Chao 2012). Dryland ecosystems make up roughly 40 per cent of the earth's land cover, accounting for 44 per cent of food production systems and 50 per cent of livestock, and are home to the highest diversity of mammals (United Nations Convention to Combat Desertification [UNCCD] 2012a). Desertification, however, is affecting the health and productivity of these systems and the communities that depend on them. Causes include human-induced climate change, overgrazing and clear-cutting of land, mining, and unsustainable farming practices, with 52 per cent of agricultural land considered to be moderately to severely affected by desertification (UNCCD 2012b). Between 1981 and 2003, 24 per cent of global land cover was degraded (UNCCD 2012b).

Degradation of terrestrial and freshwater ecosystems, continued land-use changes, and growing human demand will see biodiversity continue to fall, with major implications for current and future well-being. Trends suggest that a significant proportion of species are being driven closer to extinction. Between 1970 and 2006,

the population of wild vertebrates has fallen by nearly one third, while between 12 and 55 per cent of invertebrate and plants species are currently threatened with extinction (Secretariat of the Convention on Biological Diversity [SCBD] 2010).

Human activities that degrade the environmental systems on which humans depend impact in turn on human societies, disproportionately affecting poor and marginalised communities, and with intergenerational effect. The continuation of current trends, in line with population growth and increased consumption from growing wealth, are projected to require a 1.5–2-fold increase in food, wood, water and energy production to meet demand (SCBD 2014). The impact of human activity on terrestrial ecosystems poses a major challenge to sustainable development, and requires that development be reconciled with planetary constraints.

Education is a key component of efforts to promote healthy human–environment interaction, and in developing an integrated, multisectoral approach to sustainable ecosystems management. Understanding of concepts such as planetary boundaries, thresholds, carrying capacity, tipping points, and how biodiversity and ecosystem health underpin ecosystem function and services, which humans critically depend on, is critical. Complex human–environment interactions and dependencies necessitate a co-ordinated transformation of indivisible social, economic and environmental relations, and development of equitable solutions to sustainability.

STEM subjects can assist in the application of scientific knowledge for sustainable development, encouraging learners to be more mindful of their lifestyles and the ways in which they contribute to a lack of sustainability, while equipping them with the tools to help fix this. STEM subjects can therefore help learners understand the dynamics required to prevent 'the human system' – individual and collective, physical, social, economic, cultural and psychological – from destroying the environment on which it depends. Monitoring and evaluation of environmental systems and progress towards sustainability requires development of specific technical skills, such as data collection and analysis.

As with other key environmental issues, SDG 15 requires increased awareness and altered beliefs and attitudes. Education is needed across all stakeholders and through various forms – formal, informal and non-formal. Basic education for all stakeholders can provide an understanding of human–environment interdependencies, their role and value, and the challenges faced. Effective dissemination of scientific knowledge requires engagement with the wider public, with decision-makers and with the private sector.

Essential to sustainability are partnership stimulation and capacity development to increase effectiveness of implementation, management and governance. Access to information, training and tools is essential to providing individuals with the skills and motivation to apply sustainable management practices, including integrated

land-use planning, land capability assessment and traditional knowledge application. Communication, collaboration and capacity building will help propel development of integrated and multiscale solutions, with various sectors, institutes and stakeholders working towards joint goals. Education is critical to the participatory engagement needed to drive adoption of sustainable practices and livelihood generation, and also to dialogue that respects traditional and indigenous land rights.

Education within the private sector can also help foster voluntary uptake of private governance initiatives such as certification schemes and commitments to zero deforestation (FAO 2016). Furthermore, education should be employed to support research and innovation, career pathways and learner competencies that support uptake of sustainability.

	Knowledge and understanding	Skills and applications	Values and attitudes
ECCE	<ul style="list-style-type: none"> Elementary knowledge of the environment and land pollution. Understanding of wild animals and their habitats. 	<ul style="list-style-type: none"> Know how to take action to keep environment clean (e.g. picking up litter). Experiential learning – seeing wildlife in its natural environment, participating in school gardening. 	<ul style="list-style-type: none"> Environmental awareness. Respect for animals and appreciation for nature.
Primary Education	<ul style="list-style-type: none"> Basic understanding of forest ecosystems, freshwater ecosystems, ecosystem health and consequences of human impact. Understand the importance of biodiversity and threats to biodiversity, habitat loss; concept of endangered species. 	<ul style="list-style-type: none"> Ability to communicate the importance of terrestrial ecosystems. Analyse impacts and risks associated with biodiversity loss and ecosystem degradation. Beginning to apply systems thinking to understand ecosystem interdependencies (e.g. deforestation leads to habitat loss). 	<ul style="list-style-type: none"> Appreciation for the need to conserve biodiversity. Basic understanding of rights of other species, and valuing the interdependence of species.
Secondary Education	<ul style="list-style-type: none"> Earth sciences. Understanding of the effects of land-use change activities. Introduction of more complex concepts such as ecosystem services and environmental justice. Different forms of pollution. 	<ul style="list-style-type: none"> Environmental impact analysis, and exploration of potential solutions. Analyse issues at different temporal and spatial scales. 	<ul style="list-style-type: none"> Awareness of and support for environmentally sustainable solutions. Recognition of human–environment relationship.
TVET	<ul style="list-style-type: none"> Pollution sources. Resilient landscapes, restoration ecology, conservation science (e.g. integrated ecological–agricultural systems and biodiversity). Environmental protection policies and regulations. Development of technical expertise (e.g. building energy, wind power systems). Sustainable energy and low-carbon development for climate change mitigation. 	<ul style="list-style-type: none"> Design and implementation of sustainable management. Application of environmental protection regulations. Integration of environmental thinking into company practices. Application of new and environmentally-friendly techniques and technologies. Identification of new strategies to respond to environmental issues. 	<ul style="list-style-type: none"> Willingness to address occupational environmental issues. Respect for land and environment. Integration of environmentally friendly design and thinking into the working environment. Solutions-focused. Motivated to make the transition to low-carbon energy for a resilient future.

	Knowledge and understanding	Skills and applications	Values and attitudes
Tertiary education	<ul style="list-style-type: none"> • Interdisciplinary research for sustainable livelihood generation (e.g. focusing on crop varieties resistant to drought). • Sustainable energy and low-carbon development for climate change mitigation. • Understanding of complex dimensions that influence human impact (e.g. political, cultural). • Research on resilient landscapes to develop pro-poor, sustainable and productive landscapes (integrated ecological-agricultural systems). • Sustainable energy and low-carbon development for climate change mitigation. 	<ul style="list-style-type: none"> • Advanced research and innovation for sustainable land use. • Incorporation of indigenous knowledge into climate-proofing agriculture and food security. • Documentation of traditional/indigenous knowledge and practices. • Development of sustainable land-use management strategies appropriate to the local context. • Development of low-carbon development strategies, and application of new technologies. 	<ul style="list-style-type: none"> • Co-operation and transfer of best practices and technology. • Commitment to combat ecosystem degradation, and promote sustainable use. • Concern for fair and equitable use of resources. • Motivated to influence decision making, and to support a cultural shift. • Integration of ecosystem and biodiversity value. • Respect for the land and environment. • Keenness to make the transition to low-carbon energy for a resilient climate future.
Adult education	<ul style="list-style-type: none"> • Environmental economics and market opportunities (e.g. eco-labelling, government subsidies). • Importance of healthy ecosystems, and the impacts of environmentally degrading practices. • Environmental and legal implications of poaching and trafficking of protected species. • Land tenure and traditional rights. 	<ul style="list-style-type: none"> • Capacity to pursue sustainable livelihood opportunities and practices. • Application of climate mitigation and adaptation strategies (e.g. mixed cropping, integrated pest management). • Advocate indigenous rights. • Community education. • Protection of endangered species through increased knowledge and change in practices. 	<ul style="list-style-type: none"> • Willingness to explore solutions. • Appreciation for the intrinsic value of nature and biodiversity. • Commitment to sustainable livelihood generation. • Fair and equitable sharing of resources. • Ability to foster widespread change.

18. Goal 16 – Peace, Justice and Strong Institutions

Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

'All human beings are born free and equal in dignity and rights ... Everyone is entitled to all the rights and freedoms set forth in this Declaration, without distinction of any kind, such as race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth or other status.'

– Universal Declaration of Human Rights
(UN 1948)

SDG 16 promotes peace, justice and effective, accountable and inclusive systems for sustainable development. Protection of fundamental freedoms, and freedom from violence, abuse, trafficking and exploitation are at the core of human rights, and supported by institutions free of corruption and bribery that promote rule of law and enforce non-discrimination.

Armed conflicts, violence and insecurity are detrimental to a country's development, with potentially severe and intergenerational impacts. Displacement, injury and fatality from armed conflicts is increasing in some countries, and precipitating unprecedented population displacement and humanitarian need (UN 2016). Globally, homicides average 6.2 per 100,000 population, but with a widening gap between countries with low and high homicide rates. Homicide as an indicator of violence, insecurity and injustice suggests growing global disparities, as half of all homicides occur in countries that make up only 11 per cent of the global population

(United Nations Office on Drugs and Crime [UNODC] 2014). Regional differences highlight global divergences, with southern African countries averaging 24 homicides per 100,000 population, and with countries in South America, central Africa and the Caribbean averaging between 16 and 23 per 100,000 (UNODC 2014). Violence against children, including physical and psychological aggression, sexual violence and human trafficking, remains prevalent in various forms and a severe violation of children's rights. Paulo Sérgio Pinheiro's (2007) landmark study, presented in the 'World Report on Violence against Children', highlights the existence of violence against children in every country, across ethnicity, culture, class, education and income level.

Rule of law is defined as 'a principle of governance in which all persons, institutions and entities, public and private, including the State itself, are accountable to laws that are publicly promulgated, equally enforced and independently adjudicated, and which are consistent with international human rights norms and standards' (UN Security Council 2004). Where it fails, people face injustice, corruption, unaccountability, discrimination and inequality. According to the 2015 Global Financial Integrity report, in 2013, developing and emerging economies lost US\$1.1 trillion as a result of corruption, bribery, theft and tax evasion (Global Financial Integrity 2015).

Education is an essential tool for promoting equality, peace and justice, and supporting people's capacity to make choices. It critically helps to shape individual and societal values, and empowers people to enact them. Socio-emotional literacy and critical thinking skills support capacity for co-operation, empathy, tolerance, respect for others, acceptance of diversity and understanding of the richness of perspective that people have. Education can offer coping mechanisms, training to avoid risks and self-harm, and skills for conflict resolution and peacebuilding. Civic literacy supports access to information and justice, and the ability to engage in the political process, exercise one's rights and make choices for the common good. Education promotes

Conflict and school-based violence

Children spend more time in educational and learning environments than anywhere else outside the home (Pineiro 2007). While having significant potential to positively shape a child's life, these environments can be of negative influence when children are exposed to bullying, physical and psychological punishment, discrimination, sexual- and gender-based violence and harassment, and gang violence, among other harms. Both children and adults can perpetrate intolerance and violence, and failure to prevent and address violence can lead to absenteeism, dropping-out and lack of education, and affect social integration (Pineiro 2007). Studies have found direct correlation between school-based violence and lack of institutional intervention. Children with disabilities and learning difficulties, and those from marginalised groups (e.g. refugees, ethnic minorities, HIV positive), are at higher risk of becoming victims of violence, both inside and outside school (Rigby, 2003; Pineiro, 2007). Similarly, curricula and learning materials, and teacher and leadership prejudices and intolerance, can reinforce stereotypes and norms, and exacerbate grievances. Education, learning and curricula, policies, and interventions must explicitly reduce stigma, address discrimination and violence, and provide a safe, inclusive and supportive learning environment (including through whole-school approaches).

the foundations for productive and engaged citizenship by helping citizens to understand their rights and freedoms, democracy, and rule of law, and through the cultivation of respect and understanding of others.

The World Bank cites a negative correlation between access to education and juvenile crime, poverty, unemployment and family income (World Bank 2007). Lack of skills and opportunity can lead to marginal and illegal economic activities, and acts of violence against society (HEU 2016). In contrast, through access to quality and relevant education, education can positively impact on poverty, increasing skills and improving employment opportunities and access to decent work. Similarly, education increases the likelihood of citizens using non-violent mechanisms to voice their concerns, such as through non-violent political demonstrations, strikes, rallies, and social non-cooperation and resistance (UNESCO 2016).

Informal, non-formal and school-extension education programmes and initiatives provide an opportunity to engage with the wider community. School-community partnerships and community-based education can support wider community learning. In Pakistan, a 12 percentage point increase in women's likelihood of voting is attributed to voter-awareness campaigns prior to the 2008 elections, while anti-violence campaigns prior to the

2007 Nigerian elections reduced intimidation and led to an increase in voter turnout of 10 per cent (UNESCO 2016).

Education also has an important role to play in building the capacity of judicial and law enforcement officers, ensuring that they are equipped with appropriate knowledge, skills and values, and providing ongoing training, support and development. Citizen awareness, empowerment and the ability to utilise legal and civil mechanisms can help to drive transparency and accountability within government systems and processes, and in turn can develop confidence in those processes.

In line with SDG 16, education has a responsibility to foster tolerance and peace, and is uniquely placed to support political stability, civic engagement and inclusive development. All education and learning environments must be free of discrimination, violence and harassment of all forms, and should present an opportunity for prevention, intervention and building of resilience. Education should strive to be gender sensitive, rights based, relevant and inclusive, with a focus on life skills development, and working with the community and all of society, with special attention to vulnerable and marginalised groups. Inequality and poor quality of education can exacerbate conflict, inequalities and deprivations, and socio-political instability.

Violence prevention programmes in schools

Violence prevention programmes within education settings could take two key forms:

- programmes to address school-based violence, between pupils or between pupils and teachers;
- programmes to address other types violence which affect children and adolescents, such as child sexual abuse, dating violence and anti-social behaviour.

Programmes in schools can tackle various issues to address school violence and other types of violence; for example, healthy dating relationships and where to seek help. Innovative methods which can be integrated in programmes could include roleplaying and simulation scenarios, or the use of films or puppet shows. Example of approaches school-based programmes could take are:

- Universal approach: Activities are delivered to all students within a class or school. Programmes that go beyond curriculum-based learning and include a parental or community component, and teacher training in behaviour management, can also be known as multi-component programmes.
- Targeted approach: Activities are delivered to those at risk of becoming violent or those that have demonstrated violence, and tackle aggression, bullying and anger.

	Knowledge and understanding	Skills and applications	Values and attitudes
ECCE	<ul style="list-style-type: none"> Encounter religions and worldviews through distinguished people, books, times, places and objects, and by visiting places of worship, and listen to and talk about stories. Begin to understand the world, and similarities and differences, both with others and among families, cultures, communities and traditions. 	<ul style="list-style-type: none"> Use all senses to explore and find out about places, objects, beliefs, practices and forms of expression. Ask questions and reflect on feelings and experiences. Use imagination and curiosity to develop appreciation of and wonder at the world. 	<ul style="list-style-type: none"> Confidence and respect for self and others. Appreciation of similarities and differences between people and places. Appreciation of multiculturalism. Develop a sense of empathy towards others, and social tolerance.
Primary education	<ul style="list-style-type: none"> Linking to the expressive arts, pupils develop imaginative and creative ways of expressing some of their own commitments, including working hard at sport or music, caring for animals and the environment, loving their family or serving God. Diversity of national and international religious and ethnic identities; the need for mutual respect and understanding at global level. Religious and cultural literacy. 	<ul style="list-style-type: none"> Skills of enquiry: contribution to discussions and debates. Ability to challenge injustice and inequality. Learn to weigh up the value of wisdom from different sources, to develop and express insights in response, and to agree or disagree respectfully. Application of critical thinking skills to describe, explain and analyse beliefs, practices and different ways of life. Research and evaluation of global issues related to religion, culture, identity and peace. 	<ul style="list-style-type: none"> Appreciation of experiences of others. Value co-operation. Empathy and open-mindedness. Sense of identity and self-esteem. Belief that people can make a difference. Participation in society and civic responsibility. Confidence in beliefs and values, respect for religious and cultural differences, and willingness to contribute to a cohesive and compassionate society. Appreciate the significance and impact of different ways of life. Value justice, freedom, equality and well-being.
Secondary education	<ul style="list-style-type: none"> Similarities and differences between religions. Legal system and human rights education. Global perspective on human rights. Citizenship and peace education. Global citizenship and diversity. Relationships between governments across countries and continents. Freedom of expression and access to information. Rights and duties. Models of democracy and good governance. Political literacy: introduction of elements and processes of democracy (e.g. consultation, fairness and equity). Electoral system and importance of voting and political participation. Structures of government (national, provincial and local; central and local public services offered). 	<ul style="list-style-type: none"> Express ideas and insights about the nature, significance and impact of religions and worldviews, and how beliefs, practices and forms of expression influence individuals and communities. Interpret and evaluate texts, sources of wisdom and authority, and other evidence. Aptitude for dialogue to participate positively in a society with diverse religions and worldviews. Ability to engage in healthy debates and pacify difficult situations (e.g. conflict and anger) through dialogue. Use of critical thinking to analyse topical issues, problems and events. Problem solving and change can be achieved through political and legal systems and processes. Use analytical tools to define problems, understanding that there are often multiple, unclear or conflicting interests. Ability to argue effectively and to cope with conflict on an interpersonal level. 	<ul style="list-style-type: none"> Value the need for pluralism and enablers for different individuals and communities to live together peacefully. Respect the challenges of commitment to a community of faith or belief. Confidence to clearly and coherently articulate personal beliefs, ideas, values and experiences, while respecting the right of others to differ. Personal responsibility for emotions, accepting and validating the emotions and perceptions of others. Respect for diversity and pluralism as critical for sustainable development within the framework of democratic and ethical values. Respect for people of all ages and backgrounds. Willingness to help and support others, regardless of background. Commitment to solutions for societal and global challenges that are fair, realistic and workable, and that take all people into consideration.

	Knowledge and understanding	Skills and applications	Values and attitudes
TVET	<ul style="list-style-type: none"> Virtual reality and cyber security. Supply chain auditing and security. Good governance of extractive and land resources. Skills training for ex-combatants and child soldiers. 	<ul style="list-style-type: none"> Identify conflict and governance challenges in the supply chain, and develop solutions. Capacity to audit supply chains for conflict minerals. Implement and apply zero-tolerance policy on bribery and corruption. Rehabilitation in society. 	<ul style="list-style-type: none"> Committed to making anti-corruption part of company culture and operations, and to promoting transparency and accountability at work. Advocate peace. Assertiveness and open-mindedness, as opposed to aggression or passivity, when looking for solutions to problems.
Tertiary education	<ul style="list-style-type: none"> Effective law enforcement, with adequate anti-corruption and anti-money-laundering training. Training for security and military staff. Rule of law for civilian police. Security technology and infrastructure including radar systems. 	<ul style="list-style-type: none"> Ability to counter transnational crime, corruption and terrorism. Identify drug trafficking routes and illegal fishing. Coastguards able to guard small island states that are relatively isolated. Operational skills of law enforcers to investigate links between crimes, corruption and money laundering. 	<ul style="list-style-type: none"> Motivated to ensure global security. Reducing violence, promoting the rule of law, combating corruption and bribery. Improve marine conservation efforts and protect the world's oceans. Protect fundamental freedoms.
Adult education	<ul style="list-style-type: none"> Teacher training in sport, music and arts. Gender-based violence, rights and gender justice. Legal education. Conflict resolution. Globalisation and impact on migration and mobility. 	<ul style="list-style-type: none"> Co-operation and teamwork Assessing personal abilities and contributing to a group. Demonstrate understanding of globalisation in producing diverse forms of labour and dispossessed populations of migrants. Team building through sports, music and arts. 	<ul style="list-style-type: none"> Sportsmanship, respect and camaraderie (e.g. shaking hands after matches and competitions). Gender respect and awareness. Respect for others' contributions and styles. Motivated to seek solutions to existing problems in human flows.
	<ul style="list-style-type: none"> Convention on the Rights of the Child. Social protection. 	<ul style="list-style-type: none"> Ability to promote and support the ending of violence against children (including trafficking). Critically reflect on the processes of participation. 	<ul style="list-style-type: none"> Taking part responsibly in activities. Willingness to co-operate in building and safeguarding a fair and democratic society.
	<ul style="list-style-type: none"> Environmental law and governance. Constitutional law. Legal pluralism. International human rights law. 	<ul style="list-style-type: none"> Capacity to ensure social cohesion through environmental law and governance, including water policy and water resource governance, as well as governance of rural livelihoods. 	<ul style="list-style-type: none"> Building effective institutions, ensuring responsive and inclusive decision making and public access to information. Promoting non-discriminatory laws and policies. Committed to building democratic societies that are just, sustainable, participatory and peaceful.
	<ul style="list-style-type: none"> Legal principles of climate change. 	<ul style="list-style-type: none"> Analysis of issues related to climate change, human settlements, migration and land conflicts, and development of solutions. 	<ul style="list-style-type: none"> Increase community participation, foster a sense of belonging among migrants and build social cohesion in the face of growing cultural diversity.
	<ul style="list-style-type: none"> Peace education in conflict/post-conflict areas. Peace and values-based education for local communities. Water and land rights. Basic law and will drafting. Traditional indigenous forms of dispute resolution. Rights and responsibilities of citizenship. 	<ul style="list-style-type: none"> Application of human, legal and political rights leading to empowerment in real-life situations. Skills for solving problems and methods of alternative dispute resolution. Skills for managing and resolving conflict. Awareness that traditional systems and human rights can be directly in conflict. Ability to protect children and women from land grabbing. 	<ul style="list-style-type: none"> Perspicacity and willingness to take risks to maintain peace. Values of cultural tolerance and non-violence. Willingness to change behaviours and attitudes through sustained engagement with communities. Act as change makers. Caring for the community of life with understanding, compassion and love.

19. Goal 17 – Partnership for the Goals

Strengthen the means of implementation and revitalize the global partnership for sustainable development

SDG 17 seeks to develop a global partnership for development, in continuation of MDG 8, but with a broader perspective. It emphasises not only implementing ODA commitments but also domestic resource mobilisation and raising finance from other sources. SDG 17 also introduces new issues such as investment and enhanced North–South, South–South and triangular co-operation. It recognises data as a critical driver of development and calls for strong skills in data collection and analysis, as well as in monitoring and evaluation.

Improved and enhanced partnerships between government, the private sector and civil society are critical not just for SDG 17, but across all SDGs. All stakeholders should be brought together for resource mobilisation, capacity building, and enhanced and improved trade. Improved support for developing countries, especially the least developed countries and small island developing states, is fundamental to equitable progress. SDG 17 promotes adherence to international agreements, fostering co-operation and multistakeholder partnerships, and enhancing policy coherence, respect and support for differentiated needs and approaches (including debt management and promotion of investment), and monitoring and accountability.

As with all the SDGs, education can play an important role in propelling SDG 17. Learning can be harnessed to provide an understanding of sustainable development and the need for equitable and inclusive growth. It can foster a sense of responsibility in addressing inequalities, values of shared prosperity and collaborative approaches to problem solving, and can also empower individuals and citizens to advocate policy change. Education can help to shape popular support for ODA and

equitable trade, as well as institutional support for multisectoral planning and government accountability to SDG 17.

Annual loss through multinational tax avoidance via offshore investments is estimated to total US\$100 billion for lower income countries (UNESCO 2016). Efforts to tackle tax evasion and avoidance can be supported by the inclusion of tax education in learning curricula, helping individuals to value the social good of the tax system, improve taxpayer behaviour and increase compliance. A 14-year study of 123 countries, from 1996 to 2010, found education to be linked to positive tax-associated attitudes (UNESCO 2016).

Access to internet also remains unaffordable or unavailable in many developing countries, with only 1 in 10 people in less-developed countries being internet users in 2015 (UN 2016). Even in countries with high levels of virtual connectivity, digital divides exist within countries. Training and knowledge sharing are required for access to existing technological tools and to develop innovative and environmentally sound technologies. Access to internet can improve participation and acquisition of quality education through ICT-supported learning platforms and mechanisms, and encourage knowledge building and self-learning.

Debt-service burdens have declined and the global share of exports of developing countries has increased substantially since 2000, while global contributions to ODA have also grown, totalling US\$131.6 billion in 2015. However, aid to the poorest countries has stagnated, while less-developed country share of global exports remains small (UN 2016). As such, it is important not only to ensure ODA commitments and equitable distribution are realised but also to build capacity for more effective and efficient development assistance and use by recipients. This can occur through knowledge transfer and knowledge development in development aid issues within tertiary education programmes, and through building the capacity of academics and civil servants working in the field of aid and international development.

Training in multisectoral planning and in monitoring and evaluation can also help government officials, as well as all stakeholders, to pursue effective development co-operation. Training of civic society can similarly reinforce public monitoring and accountability of governments.

All learning environments can support the mobilisation and sharing of knowledge and expertise, and foster innovation. Capacity building strategies and programmes are important in facilitating improved domestic taxation systems

and debt management; data collection, monitoring and accountability; co-ordination across policies; and technological uptake and diffusion. Improved access to ICT can help share ideas and foster innovation. Learning that centres on collaboration and proactive engagement supports novel alliances between states, markets and technologies as well as improved effectiveness of partnerships to secure more equal, sustainable common futures.

The education funding gap

It is projected that the annual cost of ensuring access to good-quality education from pre-primary to upper secondary for every child in low- and lower-middle-income countries will rise from US\$149 billion to US\$340 billion by 2030 (UNESCO 2016). A trend of declining allocation of aid to education in low-income countries has also been seen over the past decade (OECD 2014). The Education 2030 Framework for Action sets a goal of 4–6 per cent of GDP and 15–20 per cent of public expenditure for education, but roughly half of lower income countries have tax ratios of less than 15 per cent of GDP, in comparison with emerging economies at 18 per cent, and advanced economies at 26 per cent (UNESCO 2016). In the immediate future, the education financing gap will be exacerbated by growing populations, increased proportions of participating children, increased financial demand from the SDGs, and inefficiencies in spending. The Global Monitoring Report 2015 suggests that low-income countries will need to increase education spending as a proportion of GDP by 50 per cent to meet pre-primary, primary and secondary education participation goals within the next 15 years (UNESCO 2015).

Partnerships have a key role to play in addressing the funding gap, by means such as supporting the development of complementary financing (including increased aid support), innovative approaches (e.g. corporate financing and solidarity levies), capacity building for improved tax-revenue mobilisation, and co-operation for improved predictability and stability in funding, as well as for tackling tax evasion and avoidance. Equally important is ensuring that the funds support relevant, quality and equitable provision of education, and long-term sustainability, with considerations such as demographic and economic changes. Bridging the financing gap requires efficiency of fiscal systems and allocation of funding inputs, as well as maximisation and effective utilisation of existing resources (HEU 2016).

	Knowledge and understanding	Skills and applications	Values and attitudes
ECCE	<ul style="list-style-type: none"> Activities for socialisation of children. Physical activity and diversity of play types among peers with different abilities. Creative collaboration to work in teams to design a mini-project to support better partnerships later in life. 	<ul style="list-style-type: none"> Learn how to play together and enjoy the company of others. Ability to develop relationships. Imaginative play. Singing together, going on walks in partnerships, playing in small groups. Critical thinking, analytical enquiry, numerical skills, basic statistical analysis. Arguing a viewpoint other than one's own. Communicating ideas, listening to others, working with others to solve problems. Team building and negotiation skills. 	<ul style="list-style-type: none"> Children are able to play and co-operate with others, take into account the ideas of other countries, show tolerance and understanding towards others, and develop positive relationships. Positive social and emotional behaviours. Empathising with others. Advocating policy change at local and/or national level, and taking informed and responsible action. Personal, social and emotional development. Children understand that they can expect respect, work as part of a group, taking turns and sharing fairly, and understand that groups of people, including adults and children, need agreed values and codes of behaviour to work together harmoniously. Show sensitivity to others' needs and feelings.
Primary education	<ul style="list-style-type: none"> Training for student leadership positions. The role of foreign aid in development. Understanding of humanitarian aid. The role of volunteering and community development. Understanding social capital and the role of networks. Understanding of taxes and other resource revenues, and how these are used (e.g. social welfare, education and infrastructure). Understanding of sustainable development (including current inequalities, poverty, environmental degradation) and role of partnership. 	<ul style="list-style-type: none"> Student engagement. Student-initiated networks. Networking and collaboration skills. Creativity and ability to think about things from different points of view. Understanding of the role of co-operation in addressing sustainable development. Understanding of some of the most important challenges the Commonwealth and its member countries face as global actors. Creative collaboration working in teams to design mini-projects to support the SDGs. Compliance of tax laws and other regulations. Capacity building. Innovation and technology application and diffusion. Ability to think creatively about new types of partnerships including public-private partnerships. 	<ul style="list-style-type: none"> Positive engagement in spheres of influence. Heightened awareness of the global issues affecting everybody's daily lives and how interdependent the world is. Value of volunteering and community engagement. Sense of responsibility in addressing inequalities. Collaborative approach to problem solving. Take action to help achieve the SDGs. Recognise and generate good choices, evaluate the consequences of actions, and take responsibility for one's decisions. Corporate responsibility. Social benefits of the tax system. Co-operation.
Secondary education	<ul style="list-style-type: none"> Understanding of taxes and other resource revenues, and how these are used (e.g. social welfare, education and infrastructure). Understanding of sustainable development (including current inequalities, poverty, environmental degradation) and role of partnership. 	<ul style="list-style-type: none"> Student engagement. Student-initiated networks. Networking and collaboration skills. Creativity and ability to think about things from different points of view. Understanding of the role of co-operation in addressing sustainable development. Understanding of some of the most important challenges the Commonwealth and its member countries face as global actors. Creative collaboration working in teams to design mini-projects to support the SDGs. Compliance of tax laws and other regulations. Capacity building. Innovation and technology application and diffusion. Ability to think creatively about new types of partnerships including public-private partnerships. 	<ul style="list-style-type: none"> Positive engagement in spheres of influence. Heightened awareness of the global issues affecting everybody's daily lives and how interdependent the world is. Value of volunteering and community engagement. Sense of responsibility in addressing inequalities. Collaborative approach to problem solving. Take action to help achieve the SDGs. Recognise and generate good choices, evaluate the consequences of actions, and take responsibility for one's decisions. Corporate responsibility. Social benefits of the tax system. Co-operation.
TVET	<ul style="list-style-type: none"> Understanding of tax systems and government regulations. Environmentally sound technology. Social responsibility of the private sector. 	<ul style="list-style-type: none"> Compliance of tax laws and other regulations. Capacity building. Innovation and technology application and diffusion. Ability to think creatively about new types of partnerships including public-private partnerships. 	<ul style="list-style-type: none"> Corporate responsibility. Social benefits of the tax system. Co-operation.

	Knowledge and understanding	Skills and applications	Values and attitudes
Tertiary education	<ul style="list-style-type: none"> • Training in sector planning to identify national educational targets for effective development co-operation by both the developing country government and providers of development co-operation. • Training in monitoring and evaluation for senior officials, technical experts, local governments and non-executive stakeholders for review of progress and bottlenecks. • Support interventions and practices that allow knowledge produced in universities to be shared with, and also developed with, communities. • Building collective ownership to encourage participation and shared leadership. • Governance models of partnerships, accountability and stakeholder engagement. • Developing a knowledge base for collaboration and trust building among multiple stakeholders. 	<ul style="list-style-type: none"> • Understanding of ODA, loan agreements, integrated impact assessments (IIAs), Retroactive Terms Adjustment (RTAs), etc. • Mobilising and sharing of knowledge, expertise, technology and financial resources to support the achievement of the SDGs. • Understanding of tax and fiscal burden. • Knowledge that is produced nationally is fed into the community. • Ability to review partnership strategy and structures to seize new opportunities. • Establish and promote a common agenda across sectors. • Apply knowledge to policy choices to drive development priorities. • Awareness of bottlenecks to development through peer review and self-assessment. 	<ul style="list-style-type: none"> • Committed to the sharing and transfer of knowledge, technology and technological support. • Make available the benefits of new technologies, especially information and communications. • Horizontal cooperation across sectors and actors that is key to achieving the SDGs. • Partnership and engagement for social change practices. • Partnership activities scaled up to maximise impact. • Foster effective partnerships through enabling environments. • Knowledge mobilised, processed, developed and shared. • Appreciate the value of data as a powerful tool to compare and learn from partners' experience.
Adult education	<ul style="list-style-type: none"> • Education for environmental citizenship and public participation to encourage links to be made with NGOs and community-based organisations in the research enterprises. • Training of NGOs and social movements in public monitoring, accountability and local-level governance, as well as in climate negotiations and activism. • Conflict resolution training for local beneficiaries. 	<ul style="list-style-type: none"> • Communities involved in creating and maintaining partnerships. • Strong multistakeholder partnerships that provide an enabling environment for greater development effectiveness. • Ability to negotiate with funding agencies. 	<ul style="list-style-type: none"> • Mutual accountability between the relevant stakeholders participating in development efforts, and enhancement of the quality and strength of these partnerships. • Partnerships and negotiations to address local needs.

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