# Forests, peaceful and inclusive societies, reduced inequality, education, and inclusive institutions at all levels : Background study prepared for the fourteenth session of the United Nations Forum on Forests

Gabay, Monica

United Nations

2019-03-01

Gabay , M & Rekola , M 2019 , Forests, peaceful and inclusive societies, reduced inequality, education, and inclusive institutions at all levels : Background study prepared for the fourteenth session of the United Nations Forum on Forests . United Nations .

http://hdl.handle.net/10138/311864

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## Background Analytical Study

# Forests, peaceful and inclusive societies, reduced inequality, education, and inclusive institutions at all levels

Monica Gabay[i] and Mika Rekola[ii]

Background study prepared for
the fourteenth session of the
United Nations Forum on Forests

**March 2019**

In response to paragraph 31 of resolution 13/1, the UN Forum on Forests Secretariat commissioned three background analytical studies on the contribution of forests to the achievement of the Sustainable Development Goals under review by the High-level Political Forum on Sustainable Development in 2019 in consultation with the Bureau of the fourteenth session of the Forum, taking into account the thematic priorities of the fourteenth session. The studies are: (a) Forests and climate change; (b) Forests, inclusive and sustainable economic growth and employment; and (c) Forests, peaceful and inclusive societies, reduced inequality and inclusive institutions at all levels.

## Contents

List of Acronyms iv

Acknowledgements vi

Executive Summary 1

1. Introduction: The role of forests in achieving peaceful and inclusive societies, reduced inequality, education, and inclusive institutions 2

1.1 Forests and reduced inequality 3

1.2 Forests and land tenure governance 5

1.3 Forests and education 6

1.4 Forests and peaceful and inclusive societies 7

2. Enhancing contributions of forests to social inclusion and equality 10

2.1 Role of forests in enhancing equitable and inclusive development 10

2.1.1 Strengthening local organizations 10

2.1.2 Fostering sustainable value chains 12

2.1.3 Leveraging finance for local development 14

2.2 Impacts of forest tenure and rights on livelihoods and equality 15

2.2.1 Enhancing forest-dependent communities' land tenure and access to resources 15

2.2.2 Fostering secure land tenure rights for resilient provision of ecosystem services 18

2.2.3 Inspiring corporate due-diligence for secure land tenure rights 19

2.2.4 The role of forests in supporting sustainable livelihoods and food security 20

2.3 Gender, inclusion and land tenure 21

2.3.1 Promoting gender equality and social inclusion 21

2.3.2 Improving women's land tenure and access rights 23

3 Forest-based education for sustainable development and sustainable lifestyles 24

3.1 Forests in formal education systems and curricula, informal education and learning 24

3.1.1 Best Practices in Education 24

3.2 Analysis of Current State of Forest Education 26

3.2.1 Background 26

3.3 Elementary education 26

3.4 Secondary education 27

3.4.1 General global trends in forest secondary education 27

3.4.2 Africa 27

3.4.3 Americas 28
3.4.4 Asia and Oceania 30
3.4.5 Europe 31
3.5 Tertiary education 32
3.5.1 General trends in and characteristics of forest tertiary education 32
3.5.2 Africa 36
3.5.3 Americas 37
3.5.4 Asia and Oceania 40
3.5.5 Europe 41
*3.6* Informal learning 41
3.6.1 Life-long learning 42
3.7 Public and consumers' awareness on sustainable consumption and production of forest products 44
3.7.1 Background 44
3.7.2 Production of Forest Products 44
3.7.3 Consumption of Forest Products 46
3.7.4 Public awareness of impacts of agricultural consumption and production on forests 46
3.7.5 Public awareness of forestry and forest products 47
3.8 The role of formal and informal education in public awareness 48
4 Fostering effective, accountable and inclusive forest institutions 24
4.1 Enhancing participatory and transparent forest management and land use decision-making 49
4.1.1 Promoting participatory governance platforms and decentralization processes 49
4.1.2 Empowering women and youth for effective participation in decision-making processes 51
4.1.3 Enforcing indigenous peoples' rights and free prior and informed consent 53
4.1.4 Enhancing public access to information 55
4.2 Improving forest governance, legislation and law enforcement 56
4.2.1 Targeting the challenges in forest governance for enhanced rule of law and environmental justice in benefit-sharing 56
4.2.2 Promoting market-based interventions 57
4.2.3 Furthering monitoring and accountability mechanisms 58
5 Conclusions and recommendations 59
5.1 Recommendations to enhance forests' contributions to social inclusion and equality 59
5.2 Recommendations on forest-based education for sustainable development and sustainable lifestyles 60

5.3 Recommendations to foster effective, accountable and inclusive forest institutions 61

6 References 62

Annex I - Main provisions of the US Lacey Act, the EU Timber Regulation, and the Australian Illegal Logging Prohibition Act 73

Annex 2. List of existing forest-related free learning materials and course 76

Annex 3 – Sustainable Development Goals 4, 10, 16 and 17 and Global Forest Goals 77

Annex 4- Estimated percentages of illegal logging 82

## List of Acronyms

ACFE Advisory Committee on Forestry Education
ACOFOP Asociación de Comunidades Forestales de Petén
AEETAP African Environmental Education and Training Action Plan
AFR The African Forest Landscape Restoration Initiative
AI Artificial intelligence
AILPA Australia's 2012 Illegal Logging Prohibition Act
AIPP Asia Indigenous Peoples Pact
ANAFE The African Network for Agriculture, Agroforestry and Natural Resources Education
APFNET Asia-Pacific Forestry Network
AUFSC Association of University Schools of Canada
CBD Convention on Biological Diversity
CBE Competence Based Education
CBF Community-based forestry
CBTR: Community-based tenure regimes
CECFOR The first Forestry Education and Training Center
CEDAW Convention on the Elimination of All Forms of Discrimination against Women
CEDEFOP The European Centre for the Development of Vocational Training
CIP Classification of Instructional Programs
CIS Commonwealth of Independent States
CoC chain-of-custody
CONAFOR Comisión National Forestal
CPF Collaborative Partnership on Forests
CRT Content Re-engineering Tool
CSO Civil Society Organisation
CVTS The Continuing Vocational Training Survey
DGM Dedicated Grant Mechanism for Indigenous Peoples and Local Communities
ECVET European Credit System for Vocational Education and Training
ESD education for sustainable development
EU European Union
EUTR European Union Timber Regulation (2013)
FAO Food and Agriculture Organization
FIP Forest Investment Program
FLEGT: European Union Forest Law Enforcement Law Enforcement, Governance and Trade Action Plan
FPIC Free prior and informed consent
FSC Forest Stewardship Council
GAP Global Action Programme

GDP Gross Domestic Product
GFG: Global Forest Goal of the United Nations Strategic Plan for Forests 2017-2030
GFIS Global Forest Information System
GGC global climate change
GHERA Global Confederation of Higher Education Associations for Agricultural and Life Sciences
IFSA International Forestry Students' Association
GIZ: Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
GUPES Global Universities Partnership for Environment and Sustainability
HRM human resource management
ICCPR International Covenant on Civil and Political Rights
ICESCR International Covenant on Economic, Social and Cultural Rights
IFAD International Fund for Agricultural Development
ILO International Labour Organization
ITTO International Tropical Timber Organisation
IUFRO International Union of Forest Research Organisations
LLL Life-long learning
LOtC Learning outside the classroom
MBA Master of Business Administration
MESA Mainstreaming Environment and Sustainability in African Universities
MOOC Massive open online course
NAUFRP The National Association of University Forest Resources Programs
NGO Non-governmental organizations
NRDLC Natural Resources Distance Learning Consortium
NTFP non-timber forest product
OECD Organisation for Economic Co-operation and Development
PEFC Programme for the Endorsement of Forest Certification
PES Payment for ecosystem services
REDD Reducing emissions from deforestation and degradation
SAF Society of American Foresters
SDGs Sustainable development goals
SMFEs Small-medium forest enterprises
STEM Science, technology, and Math
TAE Tertiary agricultural education
TVET Technical and vocational education and training
UN United Nations
UNCTAD United Nations Conference on Trade and Development
UNDRIP United Nations Declaration on the Rights of Indigenous Peoples
UNEP United Nation's Environmental Programme

UNESCO United Nations Education and Science Organisation

UNSPF United Nations Strategic Plan for Forests 2017-2030

USD United States Dollar

VGGT Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security

VPAs Voluntary Partnership Agreements

## Acknowledgements

The authors thank Ryo Nakamura and Hossein Moeini Meybodi of the UNFF Secretariat for their helpful comments and suggestions concerning the manuscript.

Mika Rekola wants to thank the following persons for assisting with research material: Mohamed Elfadl, Xuan Zhou, and Pihla Kivistö, and the following people who kindly provided comments on the earlier version of this study: Markku Simula, Tara Bal, and Jorma Neuvonen. All remaining errors are of course mine.

## Executive Summary

This substantive background paper presents an overview of the challenges, opportunities and priorities to enhance contributions of forests to the achievement of SDG4, 10, 16 and relevant GFGs as well as the relevant policy measures under article V paragraph 6 of the UN Forest Instrument. The key messages are:

**1. Small-scale and community forestry foster equitable and inclusive development**

Governments should enact a simplified regulatory framework for small-scale and community forestry that incentives local added value and investments in sustainable forest management including simplified management plans and tax regimes, fiscal stability and tax deductions, and infrastructure to facilitate market access. Technical support, capacity building (organizational, technical, financial, commercial) and inclusive finance are key in catalysing local small-holders and community forestry initiatives.

**2. More effort is needed to advance gender equality and youth engagement**

Governments should mainstream gender and youth perspective into policies, support women-led businesses, peer-to-peer mentoring, business incubation, networks and partnerships at the national and regional level, and enable spaces and channels for dialogue including digital technology.

**3. Secure forest tenure and access rights have a positive impact on local livelihoods and equality and provision of ecosystem services**

Governments should promote the cadastral registration of community land tenure arrangements and customary rights and enforce women's forest land tenure and access rights by means of awareness raising, leadership development and operationalisation of constitutional provisions. Resilient provision of ecosystem goods and services could benefit from flexible and agile payment for ecosystem services (PES) systems rewarding forest stewards' contributions and ensuring their financial sustainability through predictable sources of revenue such as fiscal instruments, blended finance and support to CSO initiatives (e.g. crowdfunding).

**4. Networking and cooperation are key to meet global and regional challenges**

Improved networking is needed in order to efficiently meet the global challenges for forestry. At global level a working group within International Collaborative Partnership on Forests is required. International congress on forest education is appropriate to exchange ideas and enhance networking. Strengthen regional and subregional cooperation to meet needs for education, especially teachers' trainings and education networks

**5. Development of forest education requires research, innovation and learning**

Forest education needs evidence based innovative solutions similar to any other sector. Research on education requires scientific establishment such as international associations and journals. Research is a necessity on curricula needs, pedagogical methods, teaching materials and high-tech teaching and learning innovations. Forest educators need both theoretical pedagogical training and possibilities to familiarize themselves with the forestry practices.

**6. Forest education should meet decision makers and provide life-long learning opportunities for professionals**

Executive training for decision makers can provide efficient policy results. Training courses consist of high-level lectures, excursions, discussions and networking. Establishing MBA type master's degree for those professionals not having background in forestry is an efficient solution for Life-long learning.

**7. Forest education needs public engagement and empowering vulnerable groups**

There is a need for new ways of providing forest knowledge to non-expert and people who are vulnerable. Entrepreneurship programmes for elementary education provide useful basics for forestry and other branches of economy. Social learning, informal learning and nano degrees can reach easier than before new groups of learners. There is also a need for new scholarship programmes for students coming from developing countries.

**8. Ensure responsible, inclusive and transparent forest institutions for democratic decision-making**

Governments should enable policy dialogue spaces and forest stakeholders' participation in decision-making processes ensuring inclusion of vulnerable groups including women and youth. Decentralisation provides an opportunity to advance democratic involvement of local communities in sustainable forest management. Governments should secure a level playing field and transparency in land planning processes.

**9. Address challenges in forest governance and foster timber legality**

Governments should adopt robust legal frameworks and provide for their effective enforcement to curb illegal logging and trade. The EU FLEGT initiative provides a strong blueprint that should be advanced by mobilising partnerships for development in the terms of SDG 17. Forest voluntary certification systems, labelling and codes of conduct are valuable measures to enhance sustainable forest management, provided they are combined with consumer awareness.

**10. Access to public information improves institutional quality and accountability**

Governments should implement Open Government Data policies to advance transparency and accountability, create awareness and enhance social innovation. Moreover, governments should develop effective monitoring and accountability mechanisms including policy research and critical data generation as an input for evidence-based policy making, impact evaluation and adjustment. The adoption of institutional performance measurement through a results-based approach and the implementation of key performance indicators will enhance institutional quality.

## 1. Introduction: The role of forests in achieving peaceful and inclusive societies, reduced inequality, education, and inclusive institutions

Throughout the history of mankind, forests have provided shelter, food, energy, building materials, fibres, fodder, medicine, and inspiration. The importance of forests as part of the Earth's life support system and the ecosystem services they provide cannot be overemphasized. The United Nations Forest Instrument, among its purposes, aims to enhance the contribution of forests to the achievement of the internationally agreed development goals, in particular with respect to poverty eradication and environmental sustainability (Article I). Evidence shows that the world's forests make a substantial contribution to the advancement of the Agenda 2030 and its Sustainable Development Goals (SDGs) well beyond SDG 15 (FAO 2018b, de Jong et al 2018). Forests and trees are essential to livelihoods, sustainable agriculture, adaptation and mitigation of climate change, resilience, renewable energy and regulation of the water cycle (FAO 2018b).

Within this context, this analytical background study is transversal to all the principles established in the UN Forest Instrument, especially its Global Objectives on Forests 2 and 3. It also analyses the contribution of forests to SDGs 4, 10, 16 and 17 as well as Global Forest Goals (GFGs) 3.3, 5 and 6 of the United Nations Strategic

Plan for Forests 2017-2030 (UNSPF). These linkages will be highlighted throughout the document in the pertinent sections.

Taking into account the mandate of the United Nations Forest Instrument and the UNSPF, this background analytical study is mainly focused in 'forest-dependent communities' or 'forest-dependent people.' This category is used here as an operational concept inclusive of small-holders, indigenous and traditional peoples and peasants who live in forest landscapes and derive a substantial part of their subsistence livelihoods from forests. They may extract timber and non-timber forest products and may benefit from forest ecosystem services (Chao 2012, Newton et al. 2016).

Accurate and up-to-date data on forest-dependent communities are still lacking, partly due to the difficulty in collecting reliable data and partly due to their past invisibilisation in public policies on forests (Calibre Consultants and The Statistical Services Centre - University of Reading 2000, Chao 2012). However, estimates indicate that about 1.6 billion rural people are dependent upon forests to some extent, while 1 billion out of 1.2 billion extreme poor depend on forest resources for all or part of their livelihoods, and 300 – 350 million people depend heavily on forests for their livelihoods and live within or near dense forests (Chao 2012, RRI 2015). Forest-dependent peoples, especially indigenous peoples, are vital in the conservation of forests and their biodiversity, as local and traditional institutions and practices have historically supported tropical forests, rangelands and large-scale rotational agricultural systems (Sobrevila 2008, RRI 2015).

### 1.1 Forests and reduced inequality

SDG 10 seeks to reduce inequality within and among countries. Target 10.1 establishes that by 2030, income growth of the bottom 40% of the population at a higher rate than the national average must be achieved and sustained. Target 10.2 addresses the need to empower and promote social, economic and political inclusion of all, while target 10.3 is set to ensure equal opportunities and reduce inequalities of outcome by eliminating discriminatory laws, policies and practices and promoting positive ones. Furthermore, GFG 5, target 5.1 looks at the integration of forests into national sustainable development plans and/or poverty reduction strategies.

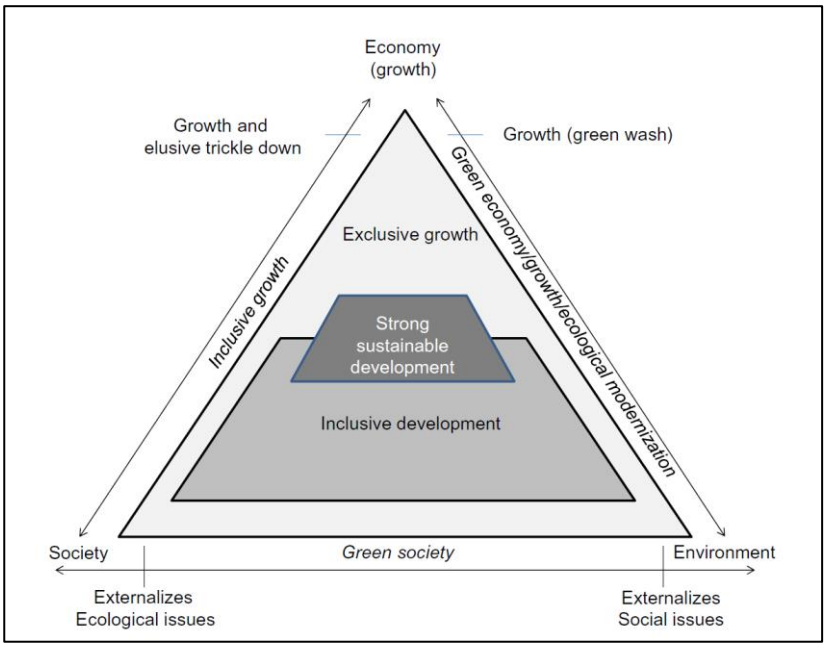
According to the World Bank (2000), poverty is multidimensional and therefore a strategy to reduce it consists of three dimensions: opportunity, empowerment and security. These dimensions are not independent but interrelated, although suitable indicators are yet to be developed to fully grasp the complexity and nuances of the concept (Angelsen and Wunder 2003, Agrawal and Redford 2006). Opportunity refers to the expansion of poor people's assets, such as land and education, and increasing the returns on them through a combination of market and non-market actions. Empowerment demands making institutions more accountable and responsive to poor people, strengthening participation of poor people in political processes and local decision-making, and eliminating the social barriers resulting from gender, ethnicity, race, religion and social status. Security implies reducing the vulnerability of poor people to ill health, economic shocks, crop failure, policy induced dislocations, natural disasters and violence, by implementing safety nets and helping them cope with negative impacts. Poverty is not only a matter of income, thus economic growth alone is not sufficient to end poverty or reduce inequality (OECD, n/d). It is also not static, people face risks at distinct stages of their lives and might fall back into poverty. Hence, vulnerability must be attended, and resilience must be promoted to advance SDG 10.

Each dimension poses challenges that need to be addressed with appropriate policies and instruments, including partnerships, if forest-dependent peoples are to overcome their vulnerability. A meta-study of 228 cases in Latin America, South Asia and Eastern Africa links local economic inequality to deforestation and forest degradation, when governments fail to address them as well as in the case of weak local institutions and insufficient collective agreement or action (Andersson and Agrawal 2011). Inequalities in the dimension of

*opportunity* involve uncertain land tenure and access rights (World Bank 2000, Angelsen and Wunder 2003, Jagger et al. 2014, RRI 2015, Coomes et al. 2016, FAO 2016a, FAO 2018b), lack of access to education and knowledge (OECD n/d a, World Bank 2000, Angelsen and Wunder 2003), deficient infrastructure, unfair trade through middlemen and lack of access to markets, lack of access to finance (OECD n/d a , World Bank 2000). Inequalities in the dimension of *empowerment* relate to weak institutions (OECD n/d a, Andersson and Agrawal 2011), power asymmetries (Pérez-Cirera and Lovett 2006, Gabay 2013), lack of enabling spaces for participation in decision-making and policy dialogues (Cornwall 2008), discrimination on account of gender, ethnicity, religion (OECD n/d a, World Bank 2000, Angelsen and Wunder 2003). Finally, inequalities in the dimension of *security* relate to lack of support for risk management and resilience, poor or no access to healthcare, water, sanitation and hygiene, lack of or insufficient basic infrastructure (e.g. electricity, roads, communications), and lack of protection against forced displacement (OECD n/d a, Angelsen and Wunder 2003).

The notion of *inclusive development* is useful to visualise SDG 10 and its targets within the context of forest landscapes. This concept involves "marginalized people, sectors and countries in social, political and economic processes for increased human well-being, social and environmental sustainability, and empowerment" (Gupta et al. 2015, p. 546). It emphasizes the social and environmental aspects of sustainable development, as it tends to balance development vs. environment trade-offs as shown in Figure 1 (Gupta et al. 2015, Gupta and Vegelin 2016).

*Figure 1. Relationship between inclusive development and sustainable development*




Source: Gupta and Vegelin (2016).

As a discursive approach, inclusive development unfolds in three dimensions comprising social inclusiveness, environmental inclusiveness, and relational inclusiveness at multiple levels (Gupta et al. 2015, Gupta and Vegelin 2016):

- ✓ Social inclusiveness relates to human rights, inequality and rural development. It involves challenges at the global level such as accounting for developing countries. At the regional level, it calls for considering the issues vulnerable countries face and the equitable sharing of transboundary resources. At the national

level, it is important to take into account vulnerable sectors, places and communities. At the local level, it focuses on accounting for marginalized or vulnerable people or groups.

- ✓ Environmental inclusiveness refers to the need to recognize that we have already transgressed three of our nine planetary boundaries (Rockström et al. 2009) and entered the "Great Acceleration" in the Anthropocene era (Steffen et al. 2007). At the local level, it relates to the need to secure tenure and access rights to natural resources and the protection of local ecosystems. At the national level, it suggests the need of adequate management of natural resources and to ensure the sustainability of ecosystem services. At the transboundary and global level, it involves the international principles of not causing harm to other countries and of common but differentiated responsibilities in dealing with global problems.
- ✓ Relational inclusiveness considers that inequality is caused by social, political and economic inclusion and exclusion, involving multi-level trade-offs between individual and collective well-being, different well-being domains and present and future well-being. This dimension calls for looking at drivers of inequality, how to empower vulnerable groups, and how to make development processes and governance arrangements more inclusive and democratic.

In this context, as it will be discussed below (see 2.3 and 4.1.2) women empowerment is key to progress towards gender equality and, thus, inclusive development, together with effective participation in decision-making processes. There are two main perspectives on the conceptualization of "women's empowerment". The development sector turns it into a technocratic category, regarding it as a goal and setting aims and targets rather than stressing gender justice, while social movements and scholars tend to view it as a continuous process of change involving self-empowerment and a challenge to patriarchal structures and institutions (Chopra and Müller 2016; Cornwall et al. 2007). An individualized and instrumental approach considers empowerment as a means to achieve development goals, while "liberating" empowerment is an end in itself leading to autonomy and self-determination (Chopra and Müller 2016). This study focuses on concrete challenges and opportunities from the perspective of development studies, as it relates more closely to that of the SDGs.

Youth and civil society should be empowered as they are important agents of transformational change to harness and realize the full potential of forests to contribute to the SDGs (CPF 2018, FAO 2018b). Youth entrepreneurship translates into innovative forest-related businesses that improve local communities' livelihoods and contribute to forest restauration, as is the case of young entrepreneurs supported by The African Forest Landscape Restoration Initiative (AFR100). More than 20 countries participate in AFR100 to realise the African Union mandate to bring 100 million hectares of degraded land into restoration by 2030. Thus, it seeks to accelerate restoration to enhance food security, increase climate change resilience and mitigation, and combat rural poverty[1].

### 1.2 Forests and land tenure governance

It must be noted that SDG 1, target 1.4 calls to ensure that "all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services including microfinance". GFG 5 supports, *inter alia,* the achievement of this target providing or the integration of forests into national sustainable development plans and/or poverty reduction strategies. A key enabling condition to achieve this is secure land tenure and access rights.

The term 'tenure' is used here to refer to any arrangement allocating rights to those who hold land, and sometimes setting conditions (FAO 2011). It regulates both access and use of natural resources. Land tenure can

[1] For more information, visit: afr100.org.

also be viewed as a *bundle of rights*, where different arrangements allocate distinct blends of rights or benefit streams and responsibilities to either individuals or groups, permanently or temporarily, exclusively or not (Bromley and Cernea 1989, Schlager and Ostrom 1992, Bromley 1992, Pacheco et al. 2009, FAO 2011, Cronkleton et al. 2012, Galik and Jagger 2015, Sikor et al. 2017). The bundle involves access, withdrawal, management, alteration, exclusion and alienation rights (Schlager and Ostrom 1992, Galik and Jagger 2015), as seen in Table 1.

*Table 1. Bundle of rights*

| Right | Description |
|---|---|
| Access | 'The right to enter a defined physical property' |
| Withdrawal | 'The right to obtain the 'products' of a resource' |
| Management | 'The right to regulate internal use patterns and transform the resource by making improvements' |
| Alteration | 'The right to change the set of goods and services provided by a resource' |
| Exclusion | 'The right to determine who will have an access right, and how that right might be transferred' |
| Alienation | 'The right to sell or lease some or all the management, alteration, and exclusion rights' |

Source: Schlager and Ostrom (1992, pp. 250-251) and Galik and Jagger (2015, p. 78).

Tenure is formal when it is recognized by statutory law or by regulation, while informal tenure refers to customary or traditional tenure systems and locally recognized rights that are not formally recognized by the State (FAO 2011). The International Labour Organization (ILO) Convention 169 concerning Indigenous and Tribal Peoples in Independent Countries and the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) have strengthened the rights to ancestral land. Other forest dependent communities remain vulnerable in terms of land tenure security and access to resources (RRI 2015). This study deals with the challenges associated to securing land tenure and access rights to forest dependent communities (see section 2.2) and provides insights on the opportunities to enhance forest governance and the rule of law (see section 4.2).

### 1.3 Forests and education

Education is large scale activity, governmental expenditures being globally on average 4.8 per cent of GDP. Private expenditures vary between countries being around 10 % of all education expenditures in OECD countries. One goal in the 2030 Agenda for Sustainable Development is directly labelled for education, that is sustainable development goal (SDG) four. Under SDG4 a set of targets and indicators has been launched. Moreover, there are six UN Global Forest Goals (GFG) which are all connected to education in a way or another. (See Appendix for details in SDG and GFG). In general, it is fair to say that attaining most SDGs in general and moving towards sustainable lifestyles in particular call for wide variety of formal and informal education. A framework for all this could be described by global drivers and megatrends, of which some are in favour to attaining SDGs through education, whereas others could be seen more like obstacles (e.g., UN Dept. of Ec. & Soc. Affairs 2018, World Economic Forum 2017):

- *Ecological and environmental changes*. Especially global climate change (GGC) and loss of biodiversity are affecting the conditions for sustainable development directly and indirectly.
- *Technological changes*. Bio-, energy, construction, communication and information technology – especially various forms of mobile technologies and artificial intelligence (AI).

- *Globalization and economic changes*. New (platform) and e-business models, individual empowerment, emerging markets, and growing demand for raw materials and natural resources.
- *Urbanization and demographical changes*. The growing number and proportion of the world's population reside in urban areas and more unequal globally.
- *Democracy-related and political changes*. Changes in governance of several societies are evolving for various reasons.

Several major trends and driving forces related to education in particular can also be recognised (UNESCO, https://futureofeducation.us/):

1. *Privatization.* New modes of education such as micro and nano learning/degrees; Competence Based Education (CBE)
2. Massification of higher education (university level)
3. Challenges listed by 2030 Agenda for Sustainable Development are
    a. Enrolment in primary education in developing countries has reached 91 per cent but 57 million primary age children remain out of school.
    b. More than half of children that have not enrolled in school live in sub-Saharan Africa.
    c. An estimated 50 per cent of out-of-school children of primary school age live in conflict-affected areas.
    d. 617 million youth worldwide lack basic mathematics and literacy skills.

Need to stress forests in education is related to aforementioned trends and drivers and is furthermore attached to changing labour markets and competence requirements and need for changes in society as whole to attain sustainable development. UNESCO in its the Education 2030 Agenda and the follow-up the Global Action Programme (GAP) have emphasised social learning and need to provide education for all citizens of all ages in order to move towards 17 SDGs by 2030 (Michelsen & Wells 2017). In essence, there is a need for change to sustainable lifestyles in the world, a change where forests and education both can play a significant role.

In this big picture forests and forestry have their own specific tasks. Globally the labour market share of forestry sector, including forestry, wood industry, and pulp and paper industry, has gradually decreased from .5% in 2005 to 0.4 in 2011. However, the role of forests covering one third of global terrestrial area and as a source for several ecosystem services, including the regulation of global climate change, cannot overstated.

### 1.4 Forests and peaceful and inclusive societies

Consistent with provisions of the International Covenant on Civil and Political Rights (ICCPR), SDG 16 seeks to promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels. Its targets related to participatory governance, access to justice and information can be traced back to the Principle 10 of the Rio Declaration on Environment and Development. This principle states that the participation of 'all concerned citizens' at the relevant level is important to handle environmental issues. This implied the obligation of the States to make information available to facilitate and encourage public awareness and participation in decision-making processes. Principle 10 also mandates that States shall provide effective access to judicial and administrative proceedings.

Many of SDG 16's targets can be related to forest issues, as the need to enhance governance and the rule of law is critical in forest landscapes. Hence, targets 16.1, 16.3, 16.4, 16.5 and 16.a can be related to illegal logging and associated trade, a challenge that requires coordinated efforts by producing and demanding countries. Illegal logging causes forest degradation and deforestation, is one of the drivers of climate change and biodiversity loss,

hurts economic development and affects forest governance (Tacconi 2007, Noguerón et al. 2018). In this study, when referring to 'illegal logging' we include the illegal forest activities detailed in Table 2.

*Table 2. Types of illegal forest activities*

| Type | Acts |
|---|---|
| Violations of indigenous peoples' rights and public or private ownership rights | Acts against constitutional, civil, criminal or administrative law |
| Violations of forest management regulations and other contractual agreements in public or private forest lands | Acts against forest legislation, commonly known as 'illegal logging' |
| Violations of transport and trade regulations or 'illegal trade' | Includes acts violating forest legislation but related to legally or illegally harvested forest products. |
| Timber processing activities | Acts against industry, trade and/or forest legislation, like the use of illegally harvested logs |
| Violation of financial, accounting and tax regulations | Acts related to legally or illegally harvested and traded timber that configure illegal financial activities. |

Source: Tacconi, L. (2007).

As discussed in section 4.2.3, there is an ongoing evolution in the regulations of timber trade, notably in the European Union, the United States of America and Australia, that enacted regimes that seek to curb down illegality by enforcing trade regulations that enable authorities to prosecute and penalize violators throughout the supply chain. Forest certification systems such as the Forest Stewardship Council (FSC) and the Program for the Endorsement of Forest Certification (PEFC) make a significant contribution to ensuring the legality of the timber supply chain.

Another aspect of governance is reflected in targets 16.6, 16.7 and 16.10 as they connect with institutions, access to information and participation in decision-making. Participation is a human right recognized under the ICCPR. The last decades have witnessed a process of decentralization and devolution that aimed at empowering local forest-dependent communities through a variety of instruments. These ranged from participatory governance platforms at forest-landscape level to forest concessions and community-based forestry. Decentralisation relates to democratisation and empowerment of local government while involving local stakeholders on a rights-based approach (Ribot 2002a, 2002b and 2004, Bruns 2003). The logic underlying the process is based in the notion of equity and efficiency, providing for the optimisation of costs and resource use, accountability, coordination and mobilization of local knowledge (Ribot 2002b, 2004). Democratic decentralization or devolution involves locally elected authorities that are accountable to local communities, thus improving public participation in decision-making processes (Ribot 2004). This institutional approach to participation is closely related to forest (and natural resources) governance.

Natural resources governance is analysed through very diverse lenses such as complex systems (Holling 2001, 2004), governance structures (Loorbach 2004), institutions or principles and rules (Ostrom 2005, 2006 [1990]), adaptative governance (Folke et al 2005, Ruitenbeek and Cartier 2001) and multi-stakeholder platforms (Faysse 2006, Steins and Edwards 1999, Warner 2004, 2006). In this context, in this study we refer to governance as "the process (or manner) through which power (or authority) is exercised to manage collective affairs of a community (or a country, society, or nation)" (Gisselquist 2012). Good governance comprises at least seven core components: i) democracy and representation; ii) human rights; iii) the rule of law; iv) effective and efficient public management; v) transparency and accountability; vi) developmentalist objectives; and vii) a varying range of political and economic policies, programs, and institutions (Gisselquist 2012).

Meaningful women participation in forest-related decision-making processes is a promise yet to be materialised in most of the developing countries. Hierarchical ideals assign a lower value to women in matters of forest management, especially in East and South Asia (Colfer and Daro Minarchek 2013). In India and Nepal, with some exceptions, women are not even nominal members of community forestry groups and receive almost no information about the discussions and decisions taken within those groups, so they are not even passive participants of those governance structures (Agarwal 2001). However, evidence shows that women's participation in community forest management improves resource conservation and regeneration, as is the case in India and Nepal (Agarwal 2009). Agarwal (2001) analyses participatory exclusions of women in community forestry and proposes a typology of participation ranging from nominal participation to interactive (empowering) participation in line with Arnstein's seminal 'ladder of participation'[2] (Table 3).

*Table 3. Types of women participation*

| Type | Characteristic features |
|---|---|
| Nominal participation | 'Membership in the group' |
| Passive participation | 'Being informed of decisions *ex post facto*, or attending meetings and listening in on decision-making, without speaking up' |
| Consultative participation | 'Being asked an opinion in specific matters without guarantee of influencing decisions' |
| Activity-specific participation | 'Being asked to (or volunteering to) undertake specific tasks' |
| Active participation | 'Expressing opinions, whether or not solicited, or taking initiatives of other sorts' |
| Interactive (empowering) participation | 'Having voice and influence in the group's decisions' |

Source: Agarwal (2001).

Among the enabling conditions for effective participation, access to information is fundamental and is a human right under the ICCPR. The notion of access is multidimensional as it is not enough for information to be physically accessible, it also needs to be presented in an accessible language that is comprehensible for non-experts. Also, when indigenous communities are interested actors, it is vital that information is translated into their language. At present, about 120 countries passed regulations on the right to information. This right is also consecrated in regional treaties in Africa, Europe and Latin America, and provisions about it are present in many regional instruments in Asia Pacific. The existence of regulations on the right to access information is not always synonymous of its implementation nor is it always accompanied by appropriate protection of the freedom of expression (Transparency International 2018). Open Data and Open Government initiatives are valuable in advancing target 16.10. However, forest-dependent peoples in the developing countries are still lagging behind in terms of communications and the digital gap is still a hindrance to fully realise the potential of digital platforms to access information and participate on-line in decision-making processes.

[2] Arnstein, Sherry R. "A Ladder of Citizen Participation," JAIP, Vol. 35, No. 4, July 1969, pp. 216-224.

## 2. Enhancing contributions of forests to social inclusion and equality

Forests provide vital support to forest communities, including indigenous peoples, small-holders and peasants. This section explores the role of forests in enhancing equitable and inclusive development, as well as the impacts of forest tenure and rights on livelihoods and equality.

### 2.1 Role of forests in enhancing equitable and inclusive development

To fully realize forests' potential to enhance equitable and inclusive development, there are some key challenges that need to be tackled. This section analyses the need to foster local organizations of forest-dependent communities (i.e. small-holders, indigenous peoples and peasants) and the importance of advancing sustainable value chains and local added value. It also shows that more needs to be done to empower women to achieve gender equality as well as social inclusion since there still are asymmetries that prevent equitable and inclusive development. Finally, access to finance is deemed essential to strengthen forest communities' ability to improve their forest-based production and income beyond mere subsistence.

#### 2.1.1 Strengthening local organizations

Community forestry and small-holders have a meaningful collective impact in the achievement of the SDGs (FAO and AgriCord 2016, Katila et al. 2017, de Jong et al. 2018). Although more research is necessary, estimates show that their combined scale must be reckon with. Mayers et al. (2016) suggest that 2.4 billion people depend on fuelwood and charcoal to cook; 28% of total income among households in forest landscapes is contributed by forest and environmental income; US$125-130 billion of gross value-added may be contributed by small-medium forest enterprises (SMFEs) worldwide; 80-90% of all forestry enterprises in many countries are SMFEs; and 1.5 billion people globally use or trade non-timber forest products. Moreover, there is evidence of the positive impact of community and small-scale forestry regarding landscape-scale improvement in forest condition (Mayers et al. 2016, Macqueen and deMarsh 2016, de Jong et al. 2018, Macqueen et al. 2018), diminishing forest loss (FAO and AgriCord 2016, de Jong et al. 2018), enhanced local livelihood (FAO and AgriCord 2016, FAO 2016b, Macqueen and deMarsh 2016, de Jong et al. 2018, FAO 2018b).

Historically, forests belonged to the State and were thus mostly under government control. This trend is reversing as customary rights and traditional tenure is increasingly recognized. Community-based forestry (CBF) is gaining momentum in the developing countries, notably in Mexico, Guatemala, Bolivia, Peru, Nepal, India, China, Vietnam, Philippines, Papua New Guinea, Cameroon, the Congo region, Tanzania, among others.

CBF refers to 'all aspects, initiatives, sciences, policies, institutions and processes that are intended to increase the role of local people in governing and managing forest resources' (RECOFT 2013, p.1). The contents of the tenure rights transferred or recognized to local communities define the type of CBF regime, ranging from participatory conservation to private ownership. In terms of the actual power to manage their forests, active control is exercised when communities' organisations are legally independent, are entitled to both subsistence and commercial use of the forest and have limited and clearly defined responsibilities to make decisions on forest management. In contrast, passive participation occurs when communities' organisations depend on administrative decisions of government officials that may also involve complex bureaucratic procedures, are entitled limited rights on the forest, mainly for subsistence, do not have clearly defined responsibilities and have little or no decision power on forest management (RECOFT 2013).

Small-holder forestry prevails in most of the developed countries, and in some European countries it accounts for over 50% of the forest land (FAO 2016a), while communities hold rights to about 34% of the forests

in the Asia Pacific region (RECOFT 2013). Estimates for Africa show that some 6.1% of the forest land is under some kind of CBF regime (although informal tenure might be significantly higher), and the figure raises to 32.3% in Latin America, and 20% in North America, excluding Mexico (FAO 2016a). It must be noted that these figures encompass widely different regimes, some of which involve a mere passive participation in government programs. Also, informal CBF regimes are not included in these estimates. The situation of forest-dependent peoples with informal CBF regimes is vulnerable, and there is a growing trend in Asia, Africa and Latin America to grant large areas to large private agri-businesses. Those grants can result in forced displacements and deprive forest communities of their livelihoods posing a threat to their very survival (FAO 2016a, Gabay and Alam 2017).

Many developing countries are adopting CBF as part of their national development strategies at a pilot scale, with support from external agencies and donors. Some countries have scaled up the model, as is the case with Gambia, Ghana and Tanzania in Africa, China, India, Nepal, the Philippines and Vietnam in Asia, and Brazil, Guatemala and Mexico in Latin America (FAO 2016a). Usually, those models also include the creation of local organizations that produce networks and facilitate technical support to their members, as well as better conditions for market access and advocacy of its members' interests. Depending on the degree of institutionalization of CBF, these local organizations may be formal or informal associations of small-holders, indigenous communities, peasants and local communities relying totally or partially on forest goods and services for their subsistence and trade in local and might reach national and international markets through networking. These organizations may also form second-tier entities that provide further support and political voice *vis a vis* government officials.

The main challenges local organizations and SMFEs face certain constraints that hinder their progress in some countries is the absence of supportive regulations and limitations in rights that hinder equitable benefit sharing. This also reflects the asymmetry of power between forest-dependent peoples and the government that derives in weak or no participation in decision-making processes. The restriction of rights prevents forest-dependent peoples from the commercial use of their forests, thus damaging their livelihoods and deepening inequality and poverty.

Another important challenge is low organizational and institutional capacities, as well as the insufficiency of technical skills in the local organizations and local governments. Closely linked with this, insufficient investments in CBF that hinders the development of start-ups, the construction of sustainable infrastructure. Furthermore, high transaction costs may discourage the government to implement support schemes as well as financial organizations that could provide the much-needed access to credit. Middle-men are also an old constraint, as market access is difficult for communities in remote areas.

There is an important opportunity for governments to leverage the benefits of CBF and local organizations to create synergies with public policies aimed at poverty (SDG 1), food security (SDG 2), reduced inequality (SDG 10), mitigation and adaptation to climate change (SDG 13), forest ecosystems' health and restoration (SDG 15), peace and justice (SDG 16), and partnerships (SDG 17). In order to harness this CBF potential, governments should, *inter alia*:

- ✓ Advance secure and, when necessary, clarify land tenure and access rights (see 2.2.1 below);
- ✓ Create and enforce an appropriate legal framework fostering participatory governance arrangements and the rule of law (see 4.1.1 and 4.2.2 below);
- ✓ Promote sustainable financial solutions for SMFEs (see 2.1.5 below);
- ✓ Provide forest communities and small-holders with technical extension and support services;
- ✓ Implement simplified bureaucratic procedures for forest communities and small-holders.

Other policy measures involve levelling the playing field so that large corporations and SMFEs can develop synergies and coexist in the marketplace; enhance transparency along the value chain; implement incentive programs including fiscal instruments that facilitate investments; encourage gender equality; promote the involvement and inclusion of youth; and support sustainable infrastructure. These measures will foster a virtuous circle of inclusive growth and stimulate forest communities and small-holders into further investing in sustainable forest management. Also useful to this end is enhancing local capacity on marketing, business management, and partnership development (deMarsh et al. 2014, ASFN CSO Forum 2015, FAO 2016a, Macqueen and deMarsh 2016).

**Box 1. Brokering market access through second tier organizations**

CBF organizations allow small-holders and forest dependent people to improve their access to markets and have more bargaining power to capture the benefits of their forest management. These organizations encourage the creation of networks through which producers can develop affirmative relationships through the creation of second-tier organizations. The second-tier organization UNICAF in Honduras comprises 12 cooperatives for whom it handled an FSC group certificate, improved market linkages and co-invested in value-added processing. In Bolivia, ADAPICRUZ sources honey from small community-based organizations and connects them to national markets. Zambia's North-Western Bee Products is a community owned company that buys and distributes honey from over 4,000 beekeepers. Nepalese Bio Trade processes and markets handmade paper, connecting 35 FSC certified community forest user groups. Chachaklum is a Guatemalan forest plantation service company that connects a network of 218 small forest growers to buyers via a transport intermediary. The Rattan Association of Cambodia helped finance the Krang Art Facility that sources rattan from the participating community groups, provides machines and training in design to improve production techniques and sells the products in the Phnom Penh market.

Source: Macqueen et al. 2018.

### 2.1.2 Fostering sustainable value chains

Sustainable value chains offer the opportunity to synergise SDGs 10, 1, 2, 17 and 15. This section looks at this potential through the lenses of companies and SMFEs, including local community forestry organisations. The perspective of the agroindustry and forestry companies offers pathways dealing with good corporate citizenship, as prescribed within the framework of such processes as the UN Global Compact, the Global Reporting Initiative and the World Business Council for Sustainable Development. Most of the top international companies in the sector are advancing 'zero deforestation' commitments in the production of agricultural commodities such as oil palm, soy, coffee, cocoa and beef, and traceability mechanisms and technology that ensure transparency along the supply chain. These pathways may involve certification schemes, and seek to harmonize food security, business profit and sustainable management of natural resources. Still, businesses have the chance to go one step further and contribute to social inclusion by engaging SMFEs and local organizations in their value chains (Box 2). In Bolivia, small-holders benefited from redistributive policies and overcoming technical and capacity constraints through partnerships with larger-scale private enterprises to increase productivity and value-chain development (FAO 2018b). A similar strategy is adopted in Tanzania, where commercial woodlot collaborate with small-holders to transfer knowledge, facilitate value added and lower transport and marketing costs (FAO 2018b). The Russian Federation implements policies to revitalise forest industries in the Arkhangelsk region, and fosters cooperation between large and small industries through the 'industrial cluster' approach (FAO 2018b).

Legal, inclusive and sustainable value chains in agriculture and forestry should be fostered and upscaled through positive incentives for companies and small producers (CPF 2018, FAO 2018b), and enhanced corporate citizenship. In order to facilitate this process, community forestry enterprises and SMFEs need to acquire knowledge on the markets and entrepreneurial skills, appropriate technology, build capacity and access finance (Galloway et al. 2014).

**Box 2. Capacity building and partnerships for market access**

Created in 1980, Rio Platano Biosphere Reserve covers 833,332 hectares of tropical forest in Honduras. The government granted the right to harvest timber to 12 cooperatives, a challenging endeavour for they lacked managerial skills, working capital and had dated equipment. These constraints together with deficient roads and heavy seasonal rainfall made it difficult for them to access markets. On the other end of the value chain, the US-based firm Gibson Musical Instruments was actively seeking FSC certified mahogany blocks for its guitars. In 2005, the Gibson Foundation and other donors supported the Rainforest Alliance to work with the cooperatives at Rio Platano Biosphere Reserve. Hence, the cooperatives formed a partnership with the Rainforest Alliance, the government agencies responsible for forestry, the Foundation for Export Investment and Development (FIDE) and donor organizations including GIZ. The three-year work addressed the cooperatives' weaknesses providing training, achieved the group certification of their operations with the Forest Stewardship Council (FSC) and the creation of a second-tier organization. The cooperatives achieved a sustained production of high-quality pre-dimensioned mahogany for guitar components with a low percentage of rejects. Income increased 128% with a 33% increase in production within the framework of management plans. Primary processing efficiency rose by 12%, from 170 board feet (bf) per cubic meter (m3) in 2005 to 190 bt/m3 in 2008. Music grade wood hiked from 17% of the total output in 2005 to 51% in 2008. As an indirect benefit, illegal traffic of timber decreased in the area managed by the cooperatives.

Source: Fortín and Butterfield 2010.

From the perspective of SMFEs, if sustainable value chains are to inform their operations while furthering social inclusion, it is necessary to overcome one critical constraint, for most of the forest regulations and development models are designed for larger industrial logging business (Larson et al 2009). Bureaucratic requirements and procedures are usually complex and demand technical advisory and the development of detailed management plans, even when indigenous communities and peasants are involved. Furthermore, sometimes multiple uses of forests and traditional practices are not considered in legal frameworks thus creating conflicts at the local level (Guariguata 2013). This is the case of various countries in Southern Asia, where unclear, lengthy and expensive procedures prevent the development of non-timber forest product (NTFP) enterprises by posing barriers to NTFP concessions (ASFN CSO Forum 2015). Also, inter-ministerial policy coordination is at times absent or conflictive, hurting the potential for community forestry trade chains. Besides, community forestry organizations often lack access to finance (ASFN CSO Forum 2015).

It is therefore necessary to develop simplified regulations and procedures to stimulate local added value and market access for community forestry enterprises and SMFEs. Also, extension work, and capacity building are key to successful community enterprises, including not only technical forestry-related aspects, but also financial literacy and management skills. Moreover, local governments and institutions can play an important role for inclusive growth and equitable benefit sharing, particularly by contributing to capacity building and technical

support. Also, they could host local delegations of national forest authorities to facilitate forest communities' and small-holders' paperwork.

There are themes that require further research and development, such as the potential contribution of bio-economy to social inclusive value chains, increasing the valorisation of forests, improving the efficiency of the use of renewable resources through the sustainable production and consumption of forest products. In northern Europe, the growing trend of producing bio-based fuels and materials from boreal forests should be balanced with biodiversity protection through collaboration of the stakeholders within the framework of National Forest Programmes (Johansson 2018). Blended finance could become an enabling factor to foster the implementation of certification schemes and other sustainability standards and practices (see 2.1.3). It is also necessary to raise consumer awareness to reward sustainably produced products (see 3.7).

### 2.1.3 Leveraging finance for local development

Recent estimates show there is an annual funding gap to achieving the SDGs of about USD2.5 trillion, and incremental annual investment should reach about 15% of annual global savings, 3% of global GDP and 1% of global financial assets (OECD 2017). Bridging this gap requires innovative approaches to development finance, for traditional solutions are not sufficient to advance the Agenda 2030. Among these innovations, blended finance appears promising as an instrument to leverage public investment, including development finance.

Blended finance is 'the strategic use of development finance for the mobilisation of additional finance towards sustainable development in developing countries' (OECD 2018a, p.4). It offers an opportunity to leverage funding to catalyse local initiatives and promote forest dependent communities and small-holders entrepreneurship. Official development finance is already leveraging funding from the private sector that amount to an additional USD 81 billion (OECD 2018a). Although blended finance is not the only source of resources, it may support women's and youth productive initiative, such as agroforestry systems, that tackle issues like food security and improved income.

The importance of the philanthropic sector should not be underestimated, as it annually allocates about USD 30-35 trillion to developing countries. Also, multilateral development banks are important to further mobilise private sector financing, as in 2016 they reportedly attracted USD 160 billion of private capital for USD 200 billion on balance sheet investment (OECD 2017). Blended finance arrangements might involve, but are not limited to, bilateral and multilateral donors including climate funds, PES schemes, public-private partnerships, commercial banks combined with public concessional finance.

Realising multidimensional inclusive development (SDG 10) within the framework of Agenda 2030 requires financial inclusion as an enabling factor for sustainable livelihoods, besides other factors. An inclusive financial sector should 'offer the majority of the population, on a sustainable basis, access to a range of financial services suited to their needs', including microfinance, understood as the provision of 'loans, savings, insurance, payments and other basic financial services to low-income populations' (Imboden 2005, p. 67). From the perspective of SMFEs, Mayers et al. (2016) classify investors into three categories: i) local investors (forest dependent communities, small-holders, natural resources users), providing labour, savings and capabilities; ii) enabling investors (government agencies, donors, NGOs), supplying capabilities, policies and security of rights; and iii) asset investors, seeking profit.

An interesting example of inclusive finance is the Forest Investment Program (FIP) and its Dedicated Grant Mechanism for Indigenous Peoples and Local Communities (DGM)[3], implemented by the Climate Investment Fund. The FIP is currently implemented in 21 countries and provides grants and low-interest loans seeking to address the drivers of deforestation and forest degradation. It fosters collaborative work of governments, multilateral development banks, communities and business stakeholders supporting forest-dependent peoples. The DGM is focused in reducing emissions from deforestation and forest degradation and its governance is led by indigenous peoples and local communities.

**Box 3. Microfinance in Ghana**

Barclays Ghana partnered with the Ghana Cooperative Sus Collectors Association and Ghana Microfinance Institutions Network to deliver banking services aimed at 70% of the population, currently unbanked, including micro-entrepreneurs. Susu Collectors provide basic banking services to people that have no access to the banking system. Barclays offers capital that Susu Collectors can loan to their clients for them to establish or develop their business; and savings accounts into which they can deposit funds for security and growth purposes. Capacity building is essential: Barclays provides training for Susu Collectors to ensure they have the correct credit risk understanding and are able to provide quality financial service to their clients. They also worked to raise awareness of the clients on banking information, savings, insurance and business record-keeping. Enabling SMEs to access capital improved their cash flows can contribute to growth and sustainability of small business. Basing product and service offerings on traditional practices that acknowledge local norms and culture contributes to the market success of the initiative. This model is replicable and scalable and on its first year had a 100% repayback record.

Source: Jenkins et al. 2007.

## 2.2 Impacts of forest tenure and rights on livelihoods and equality

Secure land tenure and access rights are critical not only to sustainable livelihoods but to the very survival of forest communities. The increasing pressure on forests and its communities poses strong challenges that need to be addressed in an innovative fashion. Forest concessions will be reviewed from the perspective of their effectiveness as a policy tool for sustainable management of forests and their impact on forest dependent communities' land tenure and access rights. Secure land tenure is also key for the resilient provision of ecosystem services. The implementation of payment for ecosystem services (PES) schemes may prove useful to enhance land tenure governance. It must be noted that women are still vulnerable, and more action is needed to ensure their land tenure and access rights. Another key issue is corporate due diligence when investing in land and avoiding forced displacement of forest-dependent communities. Lastly, yet another dimension of forest tenure and rights is food security since there is strong evidence of the role of forests in securing nutrition for forest-dependent communities.

### 2.2.1 Enhancing forest-dependent communities' land tenure and access to resources

Clear tenure and access rights are deemed key to achieve sustainable forest management, but also contribute to peaceful and inclusive societies. Among the negative effects of uncertain tenure are negative

[3] More information available at: www.dgmglobal.org.

impacts on livelihoods, food security, uses and rights of communities, conflicts and violence, low investments on silvicultural practices and sustainable infrastructure (Mutangadura 2007, FAO 2018b). Over the last decades, there has been substantial progress in reforms of the legal framework enabling decentralization and devolution processes, particularly in low- and middle-income countries (Agrawal and Ostrom 2001, Ribot 2002b, Larson et al. 2009, Cronkleton et al. 2012, FAO 2018b).

The FAO (2018b) considers the proportion of forests with secure tenure rights for local communities and other forest dependent people as a thematic metric to measure forests' role in ensuring equal rights to economic resources for all. The extent to which land tenure reforms have materialized varies from partial devolution of forest management rights to local communities resulting in co-management systems (e.g. Bolivia, Senegal, Nepal) to community forestry by empowered local organizations (e.g. Mexico, Guatemala, Tanzania). About 76% of all forest area, or 2,969 million hectares, were public property in 2010, while about 1.5 billion local and indigenous people have secured rights over forest resources through community-based tenure (FAO 2018b). Legal frameworks recognizing and securing local communities' and small-holders' tenure and access rights to forests are a key factor to reduce poverty enhancing sustainable and resilient livelihoods.

An important trend that is reshaping land tenure in Eastern and Central Europe is the process of restitution and privatization of forest land. This is the case in Bulgaria, Czech Republic, Germany, Hungary, Latvia, Lithuania, Romania, Slovakia, Slovenia and Serbia. Restitution of land 'acknowledges the continuity of private ownership rights on forest land in rendering them to the former owners or their heirs and/or to local communities and institutions' (Schmithüsen and Hirsh 2010, p.43). The situation is different in the Commonwealth of Independent States (CIS), for those countries did not readily accept the existence of privately-owned land, since CIS national forest legislation considers all forests as 'common property of the people' (Schmithüsen and Hirsh 2010).

The implementation of tenure reforms would certainly benefit from an understanding of the forest communities involved in the process, the dynamics of land occupation and use, customary rights and traditional governance structures. In order to reform tenure regimes and create enabling legal frameworks to transfer tenure and access rights to forest communities, governments and legislators should take into account customary rules and practices, as well as the trajectory and occupation patterns of the territories involved. This would reduce the risk of conflicts and tensions when implementing the new regime. Also noteworthy is the need to adapt successful models implemented in other countries to national and local realities.

Another challenge is the fact that there might be overlapping rights involving two or more groups, as is the case with many indigenous communities in Latin America. In that case, granting exclusive rights to one community may harm the livelihoods of the excluded ones and create conflicts. Furthermore, indigenous communities are not static groups and they may divide and form new separate communities, as is the case of the *mbya guarani* and *wichi* in Argentina. That might cause conflicts regarding collective property since the titles were given to a community that is now divided. Also, in Latin America, ancestral indigenous land occupation changed throughout time, with the arrival of new inhabitants. Thus, for decades, even centuries, creole peasants shared land with indigenous communities. Tenure reform may result in the displacement of creole peasants, who have no specific protection but are also vulnerable and forest-dependent. This circumstance was duly considered in Nepal, to allow shepherds herding in the highland forests (Larson, Barry et al. 2010).

Governments should adopt measures to clarify community-based forestry land tenure arrangements, improve real property registration and strengthen the cadastres. It must be noted that customary and traditional rights are still not fully registered worldwide and therefore there might be a different cadastral owner, who is legally entitled to the property. When private property coexists with customary and traditional rights, the only rightful path to implement land tenure reforms is by expropriating land or assigning public land to the affected

communities, as was the case in many Latin American countries, notably Mexico, Bolivia, Guatemala, Brazil, Nicaragua, Perú and Argentina. It is therefore important to register indigenous and traditional rights to ensure access to natural resources, sustainable use and trade.

Another aspect that governments should take into account when regulating community property regimes in Africa, Asia and Latin America is the issue of legitimacy and representation. At times, there could be a disconnect between the organisation and authority representing a community and its actual internal governance arrangements and leadership. Governments should support adequate organisational arrangements for forest-dependent communities that ensure the legitimacy of the leadership and wide participation of community members in decision-making processes, including women and youth.

Forest concessions assigned to forest-dependent communities might be a valuable instrument to secure tenure rights and enhance local livelihoods. They might also contribute to mitigating climate change, lowering carbon and environmental footprint when managed sustainably, since 72% of the tropical forests are public (FAO 2018a). There are valuable experiences of community-based forest concessions in Africa, Asia and Latin America, with particularly successful cases in Cameroon, the Congo Basin, Nepal, Indonesia, China, Vietnam, Mexico, Guatemala and Bolivia. Co-management arrangements associated to devolution schemes usually involve government control over forest resources, ranging from the approval of management plans and logging permits to the creation of specific rules for forest management and restrictive requirements and regulations that might dissuade communities of commercial uses (Larson, Barry et al. 2010). In Nicaragua and Guarayos, Bolivia, communities may extract NTFP and decide on subsistence uses, while they need to prepare a management plan to extract timber. In contrast, in Petén, Guatemala and Pando, Bolivia, communities are required to produce management plans to extract NTFP (Larson, Barry et al. 2010). Complex or exceedingly stringent regulations and bureaucratic procedures to authorise forest management plans might have negative impacts on forest-dependent peoples and render activities less transparent, promoting the 'coexistence of impracticable state law and unauthorised local practices' (Benjamin 2008: 2256, Larson and Pulhin 2012).

As previously discussed, clear tenure rights are fundamental for the adoption of a long-term sustainable approach to forest management as well as for promoting investments in better practices and infrastructure. The Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests (FAO 2012) provide governments with useful orientations since they play an important role in i) granting land tenure rights; ii) implementing those rights through community or individual property titles, forest concessions, etc.; iii) protecting community rights from powerful competing interests; and iv) promoting an enabling environment for sustainable resource use and trade (Larson et al. 2009).

Achieving secure tenure and access rights allows forest-dependent peoples to move beyond subsistence and become entrepreneurs. The growing demand for legal timber from sustainably managed forests is an opportunity to improve their livelihoods (see 3.7). Group certification contributes to improve market access, although this may require public investments in sustainable infrastructure such as roads, electricity provision and communications as enabling conditions for local added value. As noted above (see 2.1.1) capacity building efforts and knowledge sharing are necessary to promote sustainable production systems. Bureaucratic procedures should be streamlined to encourage logging and timber trade legality and reduce the possibility of corruption.

**Box 4. Community forest concessions in Petén, Guatemala**

The Maya Biosphere Reserve (MBR) is the largest protected area in Guatemala, covering over 2 million hectares of tropical rainforest. Its Multiple Use Zone (MUZ) stretches throughout 802,675 ha combining community forest concessions and biological corridors. At present, 484,392 ha are under forest concessions. There are 9 community forest concessions totaling 352,089 ha (44% of the MUZ) and two industrial concessions covering 132,303 ha (16% of the MUZ). Forest concessions contracts last 25 years and FSC certification is mandatory. The Asociación de Comunidades Forestales de Petén (ACOFOP) is a second level organisation that represents and provides technical support, social connectivity to 24 community and indigenous organisations. Positive impacts of community forest concessions include improved health and education services supported by community forestry enterprises, institutional arrangements for enhanced forest governance, capacity building for forest management, increased household income enabling better education, housing and transportation, cultural changes to regard forests as providers of goods and services and local development

Source: Monterroso et al. 2018, ACOFOP (http://acofop.org).

### 2.2.2 Fostering secure land tenure rights for resilient provision of ecosystem services

Forests and trees can be viewed as natural capital producing a continuous flow of benefits for local communities, business and society, including ecosystem services such as carbon sequestration and storage, biodiversity protection, watershed protection and landscape beauty. Pollination is one ecosystem service that has been often disregarded, although it is critical for food security. Forest communities and small-holders are key in conserving forest area, although oftentimes do not receive any compensation for their stewardship. As discussed, secure land tenure rights are a key enabling condition that allows forest dependent communities, including indigenous peoples and peasants, and small-holders to avoid displacement and are a precondition of any payment for ecosystem services (PES) scheme (Wunder 2013). Ensuring a resilient stream of benefits requires that local communities capture an equitable proportion of that value in line with the provisions of the Nagoya Protocol on Access and Benefit-sharing.

Evidence shows that PES produced mixed results and are still in a rather low level of implementation (Wunder 2013, FAO 2016a) with Latin America leading the adoption of this policy instrument. Some concerns involve high transaction costs associated with monitoring and evaluation; the small scale of most of the PES schemes implemented so far; the need to clarify whether local people in developing countries have actually benefited; the real impact on the reduction of tropical deforestation, and the increase of the competitiveness of sustainable forest management (FAO 2016a). In order to tackle these issues, it has been proposed that a gradual approach to the implementation of PES mechanisms could be effective, with a first stage dealing with the establishment of the necessary conditions to support them (Cranford and Mourato 2011).

To achieve wider adoption of PES schemes, it is necessary to develop appropriate institutions; clarify and secure land tenure rights; design PES systems that are flexible enough to generate and maintain natural capital, simple to apply, provide direct benefits to forest stewards and create momentum on the ground; establish predictable sources of revenue ensuring financial sustainability; consider social safeguards and support monitoring frameworks; communicate the benefits of PES systems (Cranford and Mourato 2011, Muradian et al. 2013, CPF 2018). In Africa, a number of ongoing initiatives seek to harness the potential of ecosystem goods and

services to achieve inclusive green growth. For example, extractable products of Cameroon's tropical forests are valued in USD 700 per hectare per year, whereas forests' climate and flood control services reach about USD 900-2,300 per hectare per year (UNECA 2016).

Some of the challenges that must be addressed in order to fully realise the potential of environmental goods and services to support inclusive development of forest-dependent peoples are related to increasing anthropization and land use changes, urbanizations of forest areas and population growth, climate change adaptation and mitigation, weak forest governance including poor law enforcement and illegal trade, gaps in scientific knowledge related to environmental goods and services, and impacts of extractive industries on forest ecosystems (UNECA 2016). As for the opportunities for forest communities to reap benefits from their stewardship of forests, certification schemes accounting for sustainable forest management could move consumers to favour those products originating in that area. REDD+ schemes, in spite of their mixed record, may also contribute to improve the recognition the role of communities as stewards of forest ecosystem resilience and mobilise private investments supporting local livelihoods.

The financial sustainability of PES systems requires predictable income sources such as fiscal instruments, like carbon taxes, and blended finance schemes that use public finance to catalyse additional investments from other sources (e.g. philanthropy, private sector, multilateral organisations). Green crowdfunding is a growing trend that may prove useful to realize sustainable PES systems that might also involve support from public finance. In Finland, the NGO Hiilipörssi[4] established a crowdfunding initiative to restore an area of peatland that was formerly drained as a contribution to mitigation of climate change. Citizens may invest in the Carbon Stock Exchange to conserve an area of 0.5 to 5 hectares of peatland through the on-line store. Fair trade schemes together with adequate support to build organisational capacity and access markets may contribute to inclusive development of forest-dependent peoples.

### 2.2.3 Inspiring corporate due-diligence for secure land tenure rights

Over the last decades, the private sector has experienced a substantial evolution in the way of doing business, with the progressive shift from compliance with command and control regimes to the voluntary adoption of best practices, codes of conduct and certification, among other instruments. The creation of the UN Global Compact, the World Business Council for Sustainable Development and the Global Reporting Initiative, evidence the emergence of a new paradigm of corporate citizenship.

In line with this new perspective and the creation of processes addressing the sustainability of production value chains, the issue of land tenure has been a contested arena. The expansion of large-scale agriculture has been one of the main drivers for tenure conflicts and dislocation of forest-dependent peoples. In 2012, the FAO produced the 'Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security' (VGGT). The guidelines address not only the governments, but also the private sector (par. 3.2):

> Non-state actors including business enterprises have a responsibility to respect human rights and legitimate tenure rights. Business enterprises should act with due diligence to avoid infringing on the human rights and legitimate tenure rights of others. They should include appropriate risk management systems to prevent and address adverse impacts on human rights and legitimate tenure rights.

[4] For detailed information, visit: https://hiiliporssi.fi/ (Accessed: 1/03/2019).

In order to provide guidance for investors on due diligence regarding land acquisition, in 2016 the FAO produced a technical guide on 'Responsible governance of tenure: a technical guide for investors'. The guidelines emphasise the need to conduct a thorough risk analysis before making a final decision on investments. During the project design phase, investors should avoid projects involving the transfer of land rights from small-holders and other local people. They should also avoid projects requiring expropriation and eviction, avoiding resettlements of any kind. The due diligence analysis should include the participatory mapping of all land-rights holders and an environmental and social impact assessment identifying potential impacts of the project on land rights, livelihoods, human rights, food security and the environment, plus mitigation measures (FAO 2016d).

Another noteworthy initiative is the creation of 'Principles for Responsible Agricultural Investment that Respects Rights, Livelihoods and Resources' (PRAI). Promoted by the FAO, IFAD, UNCTAD Secretariat and the World Bank Group in 2010, considering that Africa lagged behind Asia and Latin America in terms of agricultural investments in enhanced productivity after the Green Revolution. Increased productivity of small-holder agriculture as well as any other investment in production has a potentially positive impact on poverty reduction and growth. Following industry-led initiatives such as the Equator Principles, the Extractive Industry Transparency Initiative and the Santiago Principles, the PRAI address the challenge of avoiding conflicts between investors and local communities. The seven principles deal with: i) respect for land and resource rights; ii) food security; iii) transparency, good governance and enabling environment; iv) consultation and participation; v) responsible agro-enterprise investing; vi) social sustainability; and vii) environmental sustainability. They are consistent with the FAO guidelines for investors.

### 2.2.4 The role of forests in supporting sustainable livelihoods and food security

The livelihoods of about 1.3 billion people depend to some extent on forests, and 300-350 million people live within or close to forests and fully depend on them for their daily subsistence (Katila et al. 2017). Forests are the source of timber, fuel wood, food, fibres, medicines, clean water and shelter, among other uses, for forest communities, including indigenous peoples and peasants, all over the world (Angelsen et al. 2014, Rasmussen et al. 2017). The impact of forests on household income is substantial, according to recent estimates. A study involving 24 countries in Africa, Asia and Latin America found that an average of 22% of forest-dependent peoples' income derives from forests, with wide regional variations, of which wood fuels made up 35%, food accounted for 30%, and timber and fibre amounted to another 25% (Katila et al. 2017). It has been estimated that most of the forest-related income derives from forest environmental income (21.1%), with plantations participating in about 1% and non-forest environmental income accounts for another 6.4% (Angelsen et al. 2014).

Furthermore, in some rural communities in Cameroon, Ethiopia, Malawi and Zimbabwe, forest-related activities account for 35-39% of average income of households (Makoudjou et al. 2017). Income inequalities in populations that rely on agriculture can usually be attributed to inequalities in access to land and capital and the availability of labour, while the educational level of the head of the household correlates negatively with forest dependence (Makoudjou et al. 2017). Logging (and illegal logging) seems to be the most important factor determining forest income inequality, while income from hunting and gathering seem to reduce income inequality (Makoudjou et al. 2017).

In sum, forests contributions to livelihoods involve subsistence with wild foods supporting food security and nutrition in direct ways, income earning opportunities and ecological contributions (Rasmussen et al. 2017). Evidence shows that secure land tenure and access rights play a major role in forest-related income while land tenure insecurity translates into poverty, malnutrition, increased vulnerability, violence, disease and forced displacement (Maxwell and Wiebe 1998, UNECA 2004, Mutangadura 2007). Therefore forest-dependent peoples rely on secure land tenure and access rights. Insecure land tenure deprives them of control of the resource,

discourages investment in sustainable forest management and agroforestry. The extreme situation of tenure insecurity, in the case of dislocation, produces loss of livelihood and even of means of subsistence. Given that land plays an important role in the livelihoods of millions of rural small-holders in the developing countries, food security and poverty reduction cannot be achieved unless issues of access to land, security of tenure and the capacity to use land productively and in a sustainable manner are addressed.

An institutional setting acknowledging the particularities of community forestry is key to improving livelihoods. Besides secure land tenure rights (see 2.2.1, 2.2.2, 2.2.3 and 2.2.4 above), governments should avoid prohibitive regulations and complex procedures since they may restrict income generation for community forestry. These may involve requirements exceeding forest communities' and local authorities' economic and technical capacity that make it virtually impossible for community forest enterprises to comply. As mentioned above, governments should also further develop local communities' capacity not only in the field of sustainable forest management, but also build managerial skills and financial literacy. Another barrier SMFEs face is access to markets and getting fair prices for their products. Governments should devise policies supporting fair trade and market access for SMFEs and encourage partnerships with the private sector and CSOs to improve local livelihoods.

**Box 5. Food security and forest cover in Vietnam**

Starting in 1986, *Doi Moi* is a process of economic reform that abolished the subsidy-dependent centrally managed system, shifting to a market-driven economy through trade liberalization, land-tenure reform, and reforms in agriculture and forest sectors. Thus, households became independent production units. Farmers were given secure and transferrable land tenure for renewable periods of 30 years for annual crops and 70 years for trees and perennial crops. This encouraged long-term investment and, together with government support to agriculture and forest sectors including land tax exemptions, soft loans, export promotion, price guarantees, support for mechanisation and reduction in post-harvest losses, has driven increased agricultural production and forest cover. The government also implemented payments for forest environmental services to encourage sustainable forest management, livelihood improvement and environmental protection.

Source: FAO 2016f.

## 2.3 Gender, inclusion and land tenure

Gender equality is a fundamental human right that permeates more than SDG 5: gender-responsiveness should guide the implementation of the 2030 Agenda even regarding targets that are not gender-specific, empowering women and girls. Over 100 countries are already allocating resources to foster gender equality (UN Women 2018). Still, women are more likely to live below 50% of the median income (UN Women 2018). Moreover, about 30% of income inequality is due to inequality inside households, and between women and men. Rural women depending on forests for their livelihoods are affected by deforestation and degradation. This section addresses key elements of SDGs 10 and 16 from a gendered perspective.

### 2.3.1 Promoting gender equality and social inclusion

A large number of international legal instruments and processes tend to ensure gender equality, including the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW). Among its provisions, Article 13 mandates the States Parties to take all appropriate measures to eliminate discrimination against women in other areas of economic and social life in order to ensure, on a basis of equality of men and women, the same

rights including the right to bank loans, mortgages and other forms of financial credit, while Article 14 establishes, among others, the right of rural women to participate and benefit from rural development, particularly to obtain all types of training and education, including the benefits of extension services, in order to increase their technical proficiency, to organize self-help groups and co-operatives in order to obtain equal access to economic opportunities through employment or self-employment; and to have access to agricultural credit and loans, marketing facilities, appropriate technology and equal treatment in land and agrarian reform as well as in land resettlement schemes. Furthermore, all State Parties shall accord to women equality with men before the law, including identical legal capacity and the same opportunities to exercise it, such as the right to conclude contracts and to administer property (Article 15).

These regulations have inspired substantial progress in gender equality constitutional provisions, now present in 93% of 30 countries of Africa, Asia and Latin America that represent 78% of the world's forests (RRI 2017). Governments should further advance the effective implementation of these norms to ensure that community-based tenure regimes (CBTR) ruling indigenous and rural women's interactions with community forests are consistent with gender equality. At present, only 3% of those countries have gender-sensitive provisions regarding women's voting rights, 5% concerning leadership, 10% regarding inheritance, 18% related to dispute resolution, and 29% concerning membership (RRI 2017). Less than one third of the countries analysed establish that all daughters, widows and unmarried women in consensual unions have equal rights to inherit alongside their male counterparts. The 2018 UN Women report on gender equality in the 2030 Agenda, regarding SDG 10 states that up to 30% of income inequality is due to inequality within households, including between women and men; while women are more likely than men to live below 50% of the median income.

There is a clear gender differentiation in the roles, knowledge and skills in most forest-dependent peoples. There is also evidence that, in certain circumstances, men and women work together, as in the harvest and commercialization of high-value products such as the Brazil nuts (*Bertholletia excelsa*) in Latin America or the bush mango (*Irvingia spp.*) in Central Africa (Sunderland et al. 2014). Traditionally, women forage the forest for wild leaves, tubers, fruits, seeds, nuts, mushrooms, gums, herbal remedies, eggs and honey, while hunting and fishing are the domain of men. In many indigenous communities in Latin America and in Africa, women and girls are in charge of collecting fuelwood, which often is the only source of energy in their homes. In the Eastern Africa highlands, women and, sometimes, children, provide livestock with tree-based fodder (FAO n/d). Indigenous women in Latin America produce handicrafts that they sometimes sell or exchange for food, clothes and medicine. Women's activities make a significant contribution to overall household income.

Addressing gender inequalities requires a fundamental change in deeply rooted socio-cultural norms, attitudes, behaviours and social systems or a gender-transformative change (Hillenbrand et al. 2015, Bolin 2018). Gender-equitable transformation entails cooperative forms of power and relations affirming people's self-esteem and self-worth, their capabilities and aspirations (Cleaver 2000, Hillenbrand et al. 2015). The Forest and Farm Facility led by the FAO catalysed collective actions such as women-led group businesses and women's peer-to-peer mentoring, building a business incubation approach for women, linking groups to national and regional women's networks, and developing partnerships with other actors and social movements, including credit unions and women's labour and environmental movements (Bolin 2018). These activities were implemented in over 900 forest and farm producer organisations in Vietnam, Myanmar, Nepal, Kenya, Liberia, The Gambia, Zambia, Guatemala, Nicaragua and Bolivia and proved to have a positive impact, with success stories in Nepal, Kenya, Bolivia and Vietnam. Governments may adopt these policy measures to further the gender equality agenda.

**Box 6. Advancing women's rights in Tanzania**

Tanzania advanced gender equality in Tanzanian Constitution and Bill of Rights, Tanzania Vision 2025 and its National Strategy for Growth and Reduction of Poverty – Mkukuta I and II. Moreover, the 2001 Village act establishes that women and men have equal rights to acquire and use land and calls for women participation in decision making referred to land through equitable representation in the village land council. The 2002 Land Act established land tribunals and determined that women would have at least 43% representation, and that customs and practices contradicting gender equality were invalid. These norms and policy instruments are in sharp contrast with the actual situation of women. Estimates show that about 80% of the population are forest-dependent for their livelihoods. However, even though most of the people working the land are women, only 13.2% of female headed households receive credit to buy land. Moreover, these laws are not enforced for the view that women cannot inherit persists, thus women face obstacles to access and own land, especially when they should inherit their husbands. Tanzanian government is working to sensitise local communities to be aware of the land regime with support from traditional leaders. Also, the government promotes women's and girls' awareness, so they can exercise their rights, and mobilises local communities to update their traditional rules. Woodlot management practices are improved through capacity building activities involving women, men, girls and boys.

Source: Aguilar et al. 2011, IUCN 2012.

### 2.3.2 Improving women's land tenure and access rights

Women are increasingly playing a meaningful role in participatory forest management and the informal sector. However, there is still a long way to go to strengthen tenure rights and ensure gender equitable access to forests and trees. Land rights and its components have been discussed above (1.2, 2.2.1). In the case of women's land rights, there is one dimension that is of particular importance: security of property rights. A woman might have access rights to a woodlot but lose them, as in some areas of Africa, when she becomes a widower, as customary norms deny her the right to inheritance just as q*uechua* communities' customary norms in Bolivia deny women's rights to land. By 2011, women owned 14.3% of titled lands in Mexico (Bose et al. 2017). Recent land reform programs such as those implemented in Ethiopia and Rwanda, focused on ensuring women's names were included in the regularisation process (Meinzen-Dick et al. 2017). This is particularly relevant for social inclusion and poverty reduction. Women's land rights, if secure, may contribute to accessing credit to invest in sustainable land management to increase agricultural productivity, resulting in the possibility of enhanced rural and non-rural livelihoods.

There are also clear prescriptions regarding legislative best practices to secure the tenure rights of indigenous and rural women, such as those proposed by the Rights and Resources Initiative (2017). However, the existence of regulations granting gender equality does not automatically imply their enforcement. In Latin America, besides women's participation in community forestry governance, governments should increase women's access to the benefits of national policies and programs for productive and sustainable use of natural

**Box 7. Women's forest land tenure in Nepal**

Since 2009, Nepal implements one of the most progressive community forestry policies, allowing women equal rights with men in community forest management and use. About 25% of Nepal's forests is managed under community-based forestry, benefiting an estimate 35% of the population. There are over 19,000 community forestry groups, of which 1,072 are women-only. Under the current legal framework, husbands and wives can enjoy joint membership of community forestry organisations, and 50% of decision-making positions are reserved for women. So far, 62,032 women occupy 30% of those positions. Moreover, men migrations have secured women *de facto* tenure rights over forest land.

Source: FAO 2018b.

resources (Bose et al. 2017). Narratives and discourses have certainly evolved but are not sufficient to transform reality. The underlying causes of inequality are socio-cultural factors, including customary and traditional norms. It is therefore necessary to promote deep cultural changes, if equality is to be achieved. These processes are slow and require constant attention. For example, in Brazilian Amazon, women have an average 25 ha for agricultural production, while men have an average of 60 ha. Nonetheless, women's collective microenterprises are instrumental in overcoming this limitation as they emphasise economic advancement of women and their families, enhance women's self-confidence and social visibility, political awareness and environmental and forest management (Bose et al. 2017).

# 3 Forest-based education for sustainable development and sustainable lifestyles

## 3.1 Forests in formal education systems and curricula, informal education and learning

### 3.1.1 Best Practices in Education

Best practices of education in general are shaped by principles of active, collaborative, and phenomenon-based learning in the context of integrative pedagogics where the paramount is the communication between theory and practice. The principles of best practices can be stated as follows:

1. Teaching alignment (Biggs 1996)
2. Experiential learning (Kolb 2014)
3. Integrative pedagogics (Tynjälä 2008)

Teaching alignment is the principle according to which aims, materials and methods, and assessment should all be aligned (Biggs 1996). If the assessment for instance is not measuring the material used and material not following the aims, the effectiveness of education is diminished. Experiential learning is one form of active learning where learning takes place in the process of three elements: 1) a reflective learning phase, 2) a phase of

learning resulting from the actions inherent to experiential learning, and 3) a further phase of learning from feedback (Kolb 2014). The principle of integrative pedagogics is based on the notion of experts' way of thinking and behaving: that is, they are effectively being able to integrate theoretical knowledge, empirical-practical experiences, and their own self-regulation into a coherence way of doing (Tynjälä 2008).

UNESCO has listed non-conventional forms of learning associated with education for sustainable development (ESD) which is akin to principles discussed above. Table 4 describes seven types of learning especially useful for ESD. Some of these, such as problem-based learning, has already a long history in pedagogics and not necessarily earn "non-conventional" label (Barrows 1986). However, these all can be considered useful models in forest education as well.

Table 4. **Seven non-conventional forms of learning associated with education for sustainable development (ESD) Source: Wals (2017).**

| Type of learning | Short description |
|---|---|
| **Discovery learning** | By immersing learners in a rich context where they encounter some element of mystery, they become curious and begin to make sense of their encounter through their own exploration and meaning-making. |
| **Participatory/collaborative learning** | Although not identical, both emphasize the interaction between learning, on the one hand, and the active participation of learners in the learning process, on the other. Such approaches tend to focus on resolving a joint issue or task, which can be determined either by the learners themselves, or be decided in advance by others. |
| **Problem-based learning** | Learning focused on resolving issues or solving problems, which may be real or simulated, enables a better understanding of the issue or problem at hand. Sometimes, it allows people to find ways to actually make an improvement in real life. In some case the the learners themselves determine the issues and/or problems at stake. In other cases, these are determined in advance by others (e.g. teachers, experts, commissioning bodies). |
| **Interdisciplinary learning** | Learning that takes issues or problems as a starting point of learning and requires learners to explore them from a range of disciplinary angles, in order to come up with an integrative perspective on improving or resolving them. |
| **Critical thinking-based learning** | Learning that exposes, and questions, the assumptions and values that people, organizations and communities live by, and challenges their merit from a particular normative point of view (e.g. animal well-being, eco-centrism, human dignity, sustainability) to encourage reflection, debate, and a rethinking of those assumptions and values. |
| **Systems thinking-based learning** | Learning that seeks to see connections, relations and interdependencies in order to grasp the whole instead of just the parts, and to recognize that the whole is more than the sum of its parts. Still, it also seeks to understand that an intervention in one part of the system can affect all the others and, indeed, the system as a whole. |
| **Social learning (multi-stakeholder)** | Bringing together people of various backgrounds with different values, perspectives, knowledge and experiences, both from inside and outside the group or organization that initiates the learning process, in order to initiate a creative quest for answers to questions for which no ready-made solutions are available. |

(*Source*: Based on Wals, 2012)

## 3.2 Analysis of Current State of Forest Education

### 3.2.1 Background

A starting point to think about forest related education is that forestry, like any area of business and production, can be modelled as a combination of three basic inputs of production, namely Land, Capital, and Labour (e.g., Varian 1981). Land here refers broadly to all raw materials or inputs from ecosystems, here forest ecosystems, and capital is having machines, equipment and also knowledge related to technology, whereas labour refers to human resources. The forest ecosystem and technology related content that are typically taught intensively in forestry curricula, at the same time less emphasis given to human component (Sample et al 2015). It is human resource management (HRM) as a subject that deserves more attention in forestry and forest education, for instance, how to learn forest specific competences and generic competencies, such as communication, leadership and management. The phenomenon seems to be similar around the world and is arousing from the historical context of forest education (Barrett 1953, Sample et al. 2015, Global Outlook 2017, Villarraga-Flórez et al 2015, Lee et al. 2011)

In the following forests in education is analysed in all levels of education, that is, elementary, secondary, and tertiary. The first level is touched upon on global scale whereas later two in regional basis. The term forest education, used throughout this report, covers basically all education where forest related material is applied, independently the curricula title includes word “forest” or not. That approach is appropriate especially with elementary education. However, because of resource limitations for study the analysis of secondary and tertiary education is mainly but not systematically limited to forestry or forest science curricula.

The analysis and material of this study are based on secondary material searched from internet sources. Internet searches using mainly English language, at some extent also Spanish and Chinese, were not systematic. No survey or questionnaire was executed along the research. The material found was highly unevenly distributed among the topics. Because the analysis and conclusions drawn are based on uneven material it is fair that creditability estimates of analysis (poor, satisfied, moderate, good, excellent) are given related too each sub-sections. Subjective estimates are for subsections: elementary education (satisfied), secondary education: Africa (poor), Americas (good), Asia-Oceania (moderate), Europe (good), tertiary education Africa (satisfied), Americas (good), Asia-Oceania (good), and Europe (good).

## 3.3 Elementary education

Some best elementary level teaching practices related to forests are based on the impacts that nature have on child development. Several parallel or closely related concepts exist. Environment and Sustainability Education (ESE), Education for Sustainable Development (ESD), and Learning Outside the Classroom (LOtC) are all focusing on how to improve young people's cultural and environmental awareness. They foster a sense of connectedness to the environment typically through experiential learning (Stirling et al. 2017, UNESCO 2016, NEEF 2015, Vilhar & Rantasa 2017, Waite 2017). These approaches promote therefore awareness or environmental literacy that goes beyond knowledge of the environment, towards adoption and promotion of pro-environment attitudes and behaviour.

In some countries, environmental education has a long history: for instance, the British Field Studies Council was established already in 1943 (FSC 2018). International Environmental Education Program was initiated by UNESCO and UNEP in 1975 (Leicht et al. 2018). In some countries, environmental education programs focusing specifically on forests have been developed to complement school curricula, e.g. Australia - Forest Education Foundation 2018; Scotland - OWL Scotland 2018; USA - Project Learning Tree 2018, the forest kindergartens of European countries (Kane and Kane 2011).

So called Forest pedagogy includes active observation and experiences. Principles of the forest pedagogy are among others (http://forestpedagogics.eu/portal/): 1) to provide qualified forest-related environmental education; 2) to address all social, environmental and economic dimensions of sustainability; 3) to foster understanding, interactions and relationships of human-environmental relations in the context of sustainable development; 4) to base on knowledge about forest ecosystems and experience in sustainable forestry; 5) to contribute to education for sustainable development (ESD- UN-Decade) and cooperates with other partners engaged in environmental education or education for sustainable development; 6) to require active and cooperative educational methods and approaches; 7) to esteem, promote and offer forests as healthy and excellent learning-locations for outdoor-education.

Forest pedagogy is mainly an informal way to teach and learn nature related issues at elementary education and also at younger stage in childhood (Handbook… 2017). This has been proven to have several positive effects on learning e.g., (STEM), enhancing confidence, social and communicative skills, motivation and concentration, understanding of and connectedness to nature. Forest visits have strengthened familiarity and conscientiousness of nature (http://forestpedagogics.eu/portal/2018/10/09/fp-veda/).

Sellmann & Bogner 2013 has analysed the impact of learning in botanical gardens on students' cognitive achievement. Results show the potentials of botanical gardens as effective learning environments, and for complimenting formal school-based learning settings regarding climate change education (see section 3.6).

## 3.4 Secondary education

### 3.4.1 General global trends in forest secondary education

Secondary education can be roughly divided into general education such as upper secondary school or high school and technical and vocational education and training (TVET). This section considers mainly TVET, however, some elements of TVET are highly appropriate also for high school. In some countries it is even possible to combine high school and TVET studies. UNESCO's Strategy for Technical and Vocational Education and Training (2016-2021) is concerned with the acquisition of knowledge and skills for work life, and is expected to help youth and adults develop the skills they need for employment, decent work and entrepreneurship. It also aims to promote equitable, inclusive and sustainable economic growth, and supporting transitions to green economies and environmental sustainability (UNESCO 2016).

The lack of vocational education in several areas is a symptom of a vicious circle: there is not high demand for vocational education because the productivity of labour is low and thus the social acceptability and reward from these jobs low. And because of this low social recognition the education as such is not developing and competences of labour do not attain the full potential and finally as a results the work productivity will remain low. This circle should be broken at some intervention (Marope et al. 2015).

Many of the forestry secondary training courses are cost-intensive because they involve a lot of work in the field with expensive machineries, laboratory infrastructure and other specialist equipment and at the same time the number of students is small in comparison with other courses. As a result, from an economic perspective, many forestry training courses are a critical issue for the training institutions (Bernasconi & Schroff 2011). The status of forests in education in secondary education in different regions are described in the following sections.

### 3.4.2 Africa

In most African countries the enrolment rate in formal technical and vocational education and training (TVET) is 5 percent or less of age class. Historically TVET has not been a top priority for many African countries. It

has thus remained organized mainly in non-formally and fragmented way; often consisting of workplace learning, non-formal learning, private provision, and programs under various non-education sector ministries. TVET programs declined remarkably in the 1980s due to the adoption of Structural Adjustment Programmes (SAPs) of the World Bank (WB) and budgetary shortfalls in the education sector (Kiros 1990). On average, only about 2 to 6 percent of educational budgets are devoted to technical and vocation skills development (UNESCO 2018). Governments and international institutions have been paying increasing attention to TVET. However, the organization all tend to operate in a non-coherent way and only a few governments in Africa are able to finance TVET adequately.

The demand for TVET is very high because the unemployment rates among young people are especially high in several African countries. UNESCO has several priorities in Africa: Developing certification frameworks, testing innovative approaches, and improving monitoring and statistics.

TVET sector in most Sub-Saharan countries is characterized by a significant lack of practical relevance and responsiveness to labour market needs, insufficient infrastructure and equipment and extremely low throughputs. Reduction in employment opportunities has traditionally discouraged government support for technician training in forestry and agriculture (Kiros 1990). As a result, many technical forestry schools and colleges were closed (Temu & Kiyiapi 2008).

The major challenges in African forestry being the high usage of fuel wood and continuing forest loss and degradation. The decoupling of economic growth from deforestation is possible but needs institutional changes, new policy approaches and knowledge management. A potential example of new ways to change the direction is REDD+ mechanism. Another example is the programme to support young entrepreneurs by the African Forest Landscape Restoration Initiative (AFR100). This is also a good example of cooperation with more than 20 African countries (see Campos 2019, 3.4.1, this report 1.1). Forest issues could be too marginal in one country so that the cooperation is the only way to make efforts large enough to be at efficient scale.

A major challenge is posed by the quality in teaching. With lecturer training mainly taking place at universities, only a few lecturers combine pedagogical competencies with technical qualifications and industry experience.

Governments need to review their decisions regarding support for training technicians in forestry. It is necessary in this consideration to link such a review with decisions on technician training in agriculture, so that a broader strategy for natural resources management on farm and in forestry areas can be articulated.

### 3.4.3 Americas

**Latin America including Caribbean (LA)**

Forestry and forest industry has been under rapid change in Latin America (LA) after World War II. The LA forestry sector provided in 2001, more than 8 million jobs both in the formal and informal sector, of which one third was formal jobs. The countries where the sector provides the greatest amount of employment were Brazil, Chile, Peru, Colombia, Argentina, Mexico, Honduras and Guatemala. However, these statics are incomplete (FAO 2006). Most informal employment takes place among rural people residing in tropical forests. In L.A. the population living in or around tropical forests and savannahs is around 85 millions, of which 8 millions are living on under USD 1.25 per day (FAO 2018). In global scale this is only 3 per cent of all people living in extreme poverty.

Two specific features of LA forestry are plantations and ecotourism. Fast growing plantations are a relatively new forest management system which is now well established in many LA countries (Cossalter and Pye-Smith 2003). The share of industrial round wood from plantations rapidly increased from 5 per cent to over 30 per

cent from 1980s to the beginning of millennium. In the future the focus of plantations is switching to Africa and Asia (Kanninen 2010).

There is growing interest in LA to use ecotourism and other payments for ecosystem services (PES) activities as a vehicle for the maintenance of ecosystem services and landscape restoration, especially for biodiversity conservation. Costa Rica is considered a world leader in ecotourism hosting 2.9 million non-resident tourists in 2016; expenditure in at least partly related to nature-based being more than 4 percent of Costa Rican GDP (FAO 2018b). However, it is still somewhat unclear how objectives of environmental conservation and development can in all circumstances be achieved simultaneously, and concern has also been raised about potentially adverse impacts on rural livelihoods. The impacts on the poor have also been questioned and thereby chances to attain any SDGs in (Landell-Mills and Porras 2002, Rosa, Smith and Scherr, 2002).

Intensifying forest utilization has been a trend already since 1960s and the need for major increase of need for technicians from around 2500 to 30 000 for 1985 had been realized (Shirley and Llauradó 1969). Since then the forest education systems have varied among LA countries: some countries have training systems on all levels, others only serve some of them. It is not only the quantitative deficit that has been around but also qualitative (Musalem & Cozzi 1993). Traditionally, curricula has been concentrating on timber production, while deficit areas being administration, economics, conservation and biology (Musalem & Cozzi 1993, Guariguata & Evans 2011, Villarraga-Flórez et al. 2016). The main challenges have been lack of infrastructure, equipment, as well as technical and pedagogically trained staff (Musalem & Cozzi 1993).

The gap between working life needs and professionals' performance and education content has been remaining in many countries. Peredo (2009) has proposed that the education should be revised according to competence approach and the structure of curricula should be based on modules sequentially ordered, complementary and growing in complexity. Also a need for increasing amount of cooperation between education institutes and employers and formation has been identified.

**North America**

Forest in North America belong mainly to temperate and boreal zones with the most southern part of the US and most of Mexico being subtropical areas. The forested land area has been rather stabile recently: of total land area in Canada 38%, in Mexico and US 34% (FAO 2015.). Forestry contributes less than 0.8% to GDP in North America in 2011. North America was hit hardest by the recent global economic crisis 2008. The region experienced widescale shutdowns, production curtailments, consolidations and closures. As a result, the forestry sector in North America lost 0.6 million jobs or 39 percent from 2000 to 2011 (FAO 2014).

The education systems are different in all three countries. In Canada vocational education is placed as an upper vocational level education which takes place in over 20 schools including titles such as forestry technician, forest ecosystem technology, integrated resource management, producing all together around 100 graduates per year. Focus on development in all forestry schools of Canada has been the creation of new programs in areas such as Environment sciences and Natural Resource Conservation, and at the same time followed the relative decline in traditional forestry programs (Bernasconi & Schroff 2011).

In the United States vocational education varies from state to state. The majority of vocational training is provided by proprietary (privately-owned) career schools, whereas about 30 percent of all credentials are provided by two-year community colleges. A search for two-year vocational schools (certificate level) with forestry/forest engineering/forestry technician program from the National Center for Education Statistics provides 26 schools. Associate's level (2-4 years program) with a forestry focus provides a list of 70 schools.

In Mexico forestry training centres are run by the state forest service "Comisión National Forestal, CONAFOR" since 2002. The first Forestry Education and Training Center (CECFOR) was founded in 1953 in Uruapan

followed by another in 1976 Santa María Atzompa, and in 1983 the third one in Saltillo Coahuila. The schools, located in different regions in Mexico, have a capacity of nearly 600 people (Conafor 2016).

From 2002 to 2013, 694 students graduated in Michoacán, 335 in Oaxaca and 251 in Coahuila, making a total of 1,280 professionals. Students are committed to providing technical assistance to the ecosystems of Mexico. Young people are trained as technicians capable of responding to the needs of protection, promotion, use and sustainable regional management of natural resources. In addition to the academic program, students participate in various training activities such as: physical education and ecotechnics; operational against fires; reforestation and forestry events. Students are receiving a monthly assistance grant that will help them to pay for their expenses and not drop out of school.

Education in the CECFOR system is bivalent, which means that at the end of education students obtain certification as a forestry technician and the baccalaureate and they are ready to join the labor market. Alternatively, graduates may continue with higher education in university and technology institutions.

**Asia and Oceania**

Because of rapid economic growth in several Asian countries there is need for better-skilled workforce to increase productivity and accelerate private sector development. There is also need for improved skills to help people to access better-paid jobs (ADB 2017). TVET, issues range from insufficient teachers and trainers in Bangladesh to lack of quality monitoring system in Nepal, and to inadequate industry participation in Sri Lanka. Among the common issues identified are weak quality assurance mechanisms, low employment rate of graduates, lack of information about demand (leading to a mismatch between training and available jobs), expensive and long-term training that excludes the poor and marginalized, weak institutional arrangements, and inadequate provision of high-quality TVET to manage and scale up training programs (ADB 2015).

Wars and colonial exploitation were significant factors in historical patterns of deforestation in Asia in nineteenth and early twentieth centuries (Williams 2002). Professional forestry education was introduced in Asia almost 200 years ago upon the realization of the importance of the forest and its resources (Daramola 2010). In the 1960s and 70s development cooperation in the forestry sector predominantly targeted forest plantations, forest industries and forests for watershed protection. Along this line forestry professionals have traditionally been trained to understand the biophysical aspects of forest and timber production (Dourojeanni & Vonhof 2010). However, this approach was not always successful, and governments gradually appeared to lose their effectiveness as forest managers and wood production is perceived as of diminished importance relative to other forest values (Tengnäs et al. 2008).

Until today, deforestation and forest degradation are continuing problems for many countries in south-eastern Asia. Traditional forestry management positions seem to dominate ministries of forestry and natural resources. However, the variation between countries is significant. For many Asian countries economy is flourishing and reaches middle class economy. Furthermore, there is a problem of migration from country rural areas to cities. Governments are keen to create employable skills and competencies relevant in the labour market through adoption of a comprehensive system of skill development.

Technical level forestry education is decreasing in most countries (Laos being an exception). As in the African case, this raises two concerns: first, about future availability of personnel for field-level work in the forestry sector; and, second, about the competence related to new job demands among those who graduate. Further studies are needed (Temu et al. 2005).

Case: Vietnam

The key problems within the TVET system in Vietnam are well known and include: i) Fragmentation in TVET organization and management; ii) Weak capacities of TVET institutions managers; iii) Low capacity of TVET teachers; iv) Training courses are poorly aligned to diversified needs of labour markets and employers; v) The rural poor have limited information and access to TVET system. Currently, there are a number of the vocational training models in Vietnam and each of the models has its own advantages and disadvantages. The dominant model is still the traditional Vocational Training Model (Pompa 2013).

Virtually all vocational secondary schools and most postsecondary institutions are specialized by sectors or sub-sectors, e.g., agriculture (forestry, fisheries, horticulture), transport, construction, industry, etc. No aggregate data are available on the numbers of institutions or enrollments by sector specialization.

Although, agriculture, forestry and fisheries remain as the main sources of employment in the country, but the TVET in agriculture, forestry and agroforestry is small compared to the other sectors such as industry. Even, within agriculture the share of forestry is small. Full-time training programmes include locally popular vocations such as food technology, business accounting, applied information technology, aquaculture cultivation, fisheries, veterinary service and plant protection (Pompa 2013).

Vietnam's acute skill shortage represents a major challenge for the country as it tries to improve its global competitiveness. Despite government efforts, TVET system remains a complex one, with multiple stakeholders operating at different levels, which has led to many inefficiencies and duplication of efforts. A fundamental shift is needed from quantity to quality and more and better engagement with businesses in order to achieve a demand-led TVET system that answers to the needs of the workforce and the private sector. There is significant space within the system for a new player to look at successful and innovative ways in which the private sector can be engaged in TVET.

**Europe**

Vocational education has deep roots in some European countries such as Germany, Austria, and Scandinavian countries. The length of secondary vocational school is mainly three years in most European countries. Learning through work is especially well-organised in several Middle European Countries. Each country has their own systems for vocational training, however, within the European Union (EU) co-operation does exist, such as European Credit System for Vocational Education and Training (ECVET). In general, the EU has launched an education harmonisation policy since Bologna declaration 1999 concerning higher education (http://www.ehea.info/pid34248/history.html).

The European Centre for the Development of Vocational Training (CEDEFOP) is a European agency that promotes and develops vocational education and training in the European Union (EU). Recently, it describes itself as promoting the European area of lifelong learning. Several concrete actions have been Content Re-engineering Tool (CRT), a common qualifications framework, Europass curriculum vitae, and an ePortfolio connecting together different stages of education (European Commission 2005).

The Continuing Vocational Training Survey (CVTS) is an enterprise survey which is part of the EU statistics on lifelong learning. The aims of CVTS are concerning continuing vocational training in enterprises and covers among others the following topics: continuing vocational training, skills supply and demand, training needs, and Initial vocational training (https://ec.europa.eu/eurostat/web/microdata/continuing-vocational-training-survey).

Forests in Europe consists of 32 per cent of land and forest sector's share of European GDP is around 1.0 %. Europe produces and consumes very large volumes of forest products, and moreover, it is a net exporter of forest products to the world market. The European forest industry has recently profoundly changed due to

globalisation (European Forest Sector 2011). The concept of green jobs, introduced by EU Forest Europe Ministerial Conference 2015, embraces manifold opportunities for the forest sector to diversify its activities and income. It also includes the ideas of diversification of traditional forest management, finding new opportunities for job creation e.g., in sectors like the emerging bioeconomy.

Implementation of the green jobs concept provides significant opportunity for the sector to also reinforce its social pillar of sustainability, making work in the sector more decent, inclusive and gender-balanced (qualitative shift). One of the concerns behind this initiative is the demographic change, from rural to urban, and as a result there will be an increased need to ensure quality working standards to attract people to rural areas to manage forests. The focus should thus be on occupational health and safety, job stability, skills development, equity and social dialogue (Draft of Pan-European Guidelines for the Promotion of Green Jobs in the Forest Sector 2018. A draft)

## 3.5 Tertiary education

### 3.5.1 General trends in and characteristics of forest tertiary education

Tertiary education stands for college, polytechnic, university of applied sciences and academic university levels. It can be classified roughly into two: non-university and university education. Within university education typically distinction is made between Baccalaureate and Masters level. What is true for Masters level is often valid for PhD education as well. In this paper the PhD education is not analysed separately because it is often seen as a part of research activities not purely education.

The list of tertiary forest education programs is available in GFIS platform where more than 1200 programs globally are listed (GFIS.net). Tertiary forest education is traditionally predominately described as:

- professional education, similar to physicians contrast to natural science M.Sc degree
- multidisciplinary compared to natural science M.Sc. and M.A. degrees
- sustainability oriented, even though the content of sustainable development has been traditionally narrowly understood.

Some other major drivers in tertiary forest education are (SILVA 2014, Bullard et al. 2015, Sample et al 2015, Sharik et al. 2015, Innes and Ward 2007, Kanowski 2001, 2015, Ketlhoilwe & Jeremiah, 2010, Rouleau et al. 2017):

- Consolidation of traditional forestry programmes with other disciplines or termination of specialised forestry programmes
- Increasing demand for social aspects of forests and generic skills component
- Internationalization
- Diversification of enrolment figures worldwide: decreasing numbers in OECD countries and increasing in some other countries
- The decline in the number of people seeking to study for a traditional forestry degree
- Integrative skills and interdisciplinary behaviour in forestry and natural-resource science have become increasingly important.
- Training of the staff members and expertise is essential to make progress in mainstreaming of environmental and sustainability issues in higher education

An important element in tertiary forest education is field education. Inspired with “a love for the outdoors” and “hands-on learning” approaches forestry students all around the world has traditionally been eager

with field experiences. Although this approach is most likely worth of continuing in the future, it is true that not all students look forward to or do well in an outdoor classroom. A summer field camp may pose a financial burden as students have to forgo the opportunity to work. Not all forestry students will become field foresters and mandatory field camps may dissuade some students from pursuing forestry as a major or career (McGown 2015).

At this point it has to be carefully reflected the idea of tertiary forest education because of the fact that the original idea of forester (forest ranger) is in many circumstances old fashioned. These kind of working positions simply do not exist any more at that numbers they did in earlier days, instead more diversity is observed at the labour market (Bullard et al. 2015).

The difference between practically oriented Bachelor level degrees, such as BS in Forestry or "Ingeniero forestal", and scientific-theoretically oriented degrees have been recognised for a long time (FAO 1994). The crucial question is whether there is any more a need for practically oriented forestry university degrees? The question could be reflected doing some benchmarking for instance in agriculture or medicine.

Seemingly, new approaches are needed for traditional field education especially to learn social sciences and entrepreneurship (Global Outlook...2017). Also the principles from the best practices of education should be bear in mind. It is not enough to use hands on learning but the enough focus on reflection and integration practice and theory must be taken as well (see also Pohlschneider & deLima 2016). Key elements in this sense are learning of generic skills, working life skills, and concepts of agency and self-direction skills.

To achieve a balance between depth and breadth and traditional forest and new working title needs, the intellectual goals for educating forestry students in both content and process should include following elements:

- Mastery of research methods (problem definition, research design, analytic tools, problem solving) in areas of interest to the student
- Sufficient breadth of knowledge and skills necessary for working with diverse groups both within and outside the student's field of study
- Competency in communicating with diverse audiences
- Specialized knowledge that provides an in-depth understanding of concepts, processes, and interactions within a scientific discipline

These educational goals are mainly manifested in curricula. It is worth of Curriculum revision process - not only the revision as a product – as it is important because it links academia, employers and other stakeholder together and strengthens their mutual relationships (Bullard et al. 2014). Sustainability science and education paradigm has been shifting traditional science and education approaches since UNESCO-UNEP International Environmental Education Program in 1975. However, many university programmes are still lacking education of competences for sustainable change (Dedeurwaerdere 2013).

Curriculum revision also highlights the fact that research on forest education is slight and there is an urgent need for topical research on forestry education. An example of using a research based approach in developing forest education is the curriculum revision process conducted at Stephen F. Austin State University in US (Bullard et al 2014, Bullard et al. 2015).

To conclude the guidelines for the future for tertiary forest education three principles and actions therein are presented.

1. Multidisciplinarity. Action: use capstone courses combining several disciplines and multidisciplinary team assignments.

2. Sustainability. Action: integrate specific sustainability courses into curricula, build on the old forestry tradition of sustainability to integrate modern ecosystem services approach.
3. Generic skills and competences. Action: Integrate learning of generic skills and competences as well as social sciences into traditional forest education. For instance, organise an intensive course around social surveys to be held in a campus – not in the field station where the chances to interact with non-academia people are limited.

It is fair to say that the role of practical forestry degrees vary a lot between regions and countries and most likely the importance is decreasing also in the future. However, as far as these degrees exist it would be useful to have an international forum for discussion the core content of that curriculum. It was stated already by FAO (1994) that there are certain expertise that no other profession has such as timber logging. The forum to discuss about core content, however, need to be organised using modern non-bureaucratic way. The role of scientific platforms and other information dissemination, such as wiki-type solutions, are needed (Lee et al. 2011)

Until 1997, the FAO Advisory Committee on Forestry Education (ACFE) used to monitor global trends in forestry and advise on forestry education issues. The collapse of the Committee has created an information and networking vacuum. Currently, the forestry education community lacks a joint international mechanism to guide the improvement of forestry education (FAO, ANAFE and SEANAFE 2005). The changes in curricula are usually ad hoc, as opposed to the result of conscious processes and interactions needed to produce robust forestry programmes (Temu et al. 2005).

Benchmarking with education is illustrative in two respect: networking and journal publishing. There are very few forest education related conferences. A series of International Conferences on Environmental Education (ICEE) has been held since the first intergovernmental Conference on Environmental Education was organised by UNESCO and UNEP and held in Tbilisi, Georgia (USSR) in 1977.

There used to be a number of international forest education congresses. The first global workshop on forestry education was held in 2007 at the World Agroforestry Centre (ICRAF) in Nairobi, Kenya (Temu & Kiyiapi 2008). Next year, International Partnership for Forestry Education (IPFE) was created as a global network of institutions concerned with forestry education. IPFE is a voluntary mechanism for coordinating international efforts to advance forestry education. Olympic Forestry Education Symposia was organised in 2008 in Beijing. IPFE also co-organised the Second International Symposium on Forestry Education in Vancouver in May 2010. IPFE has not been active recently.

To make some benchmarking to other disciplines, let us take an example from medicine. There are several networking associations and congresses of university education in the fields of medicine such as An International Association for Medical Education (AMEE), Association for the study of Medical Education (ASME) and Global Alliance for Medical Education: AMEE annual conference alone has increased steadily and now attracts over 3200 delegates (https://amee.org/conferences).

Scientific journals on forest education are extremely rare or non-existing. There are a few journals on environmental education, but not any for forest education. Neither Journal of education in natural resources and life sciences does not exist anymore (**Error! Reference source not found.**

Table ***5***). For instance, Natural Sciences Education (https://dl.sciencesocieties.org/publications/nse) is mainly focused on agricultural education, Journal of Education for Sustainable Development is a highly relevant journal, however, not often publishing any forest education specific articles.

**Table 5. Journals of environmental education**

| Journal Title | Online address |
|---|---|
| Applied Environmental Education and Communication | https://www.tandfonline.com/loi/ueec20 |
| Australian Journal of Environmental Education | https://www.cambridge.org/core/journals/australian-journal-of-environmental-education |
| Canadian Journal of Environmental Education | https://cjee.lakeheadu.ca/ |
| Children, Youth & Environments | https://www.jstor.org/journal/chilyoutenvi |
| Green Teacher | https://greenteacher.com/ |
| Environment and Behavior | https://journals.sagepub.com/home/eab |
| Environmental Communication: A Journal of Nature and Culture | https://www.tandfonline.com/toc/renc20/current |
| Environmental Education Research | https://www.tandfonline.com/loi/ceer20 |
| International Journal of Early Childhood Environmental Education | https://naturalstart.org/research/ijecee |
| International Electronic Journal of Environmental Education | http://dergipark.gov.tr/iejeegreen |
| International Journal of Environmental and Science Education | http://www.ijese.net/ |
| International Journal of Environment and Sustainable Development | https://www.inderscience.com/jhome.php?jcode=ijesd |
| International Journal of Sustainability in Higher Education | https://www.emeraldinsight.com/journal/ijshe |
| Journal of Education for Sustainable Development | https://journals.sagepub.com/home/jsd |
| Journal of Environmental Education | https://www.tandfonline.com/loi/vjee20 |
| Natural Sciences Education | https://dl.sciencesocieties.org/publications/nse/about |

Comparing to medical education, on the contrary, is again useful. There are more than 15 international journals of medical education (Azer et al. 2016). This number can be put in the context when thinking about the total number of students in different fields. Looking from OECD statistics there has been altogether 1,4 million agriculture, forestry and fisheries students between 1998 and 2012, whereas the number of health students is 8,7 million (https://stats.oecd.org/). The number of health students is thus around 6 times higher than the number of students in agricultural and related fields. This ration in mind one might say that one or two journals of agricultural and related science education is warranted.

A potential for new global mechanism could be found in the Global Universities Partnership for Environment and Sustainability (GUPES). This partnership could be established together with regional networks, such as The African Network for Agriculture, Agroforestry and Natural Resources Education (ANAFE), Mainstreaming Environment and Sustainability in African Universities (MESA), Asia-Pacific Forestry Network (APFNET), Silva Network, The National Association of University Forest Resources Programs (NAUFRP), Association of University Schools of Canada (AUFSC) and Global Confederation of Higher Education Associations for Agricultural and Life Sciences (GHERA). Other potential partners are International Forestry Students' Association (IFSA) ja International Union of Forest Research Organisations (IUFRO). A new partnership programme could tentatively have action items that are currently mostly missing in global scale, namely, international conferences and scientific publications around forest education.

**Africa**

Sub-Saharan Africa has traditionally had the lowest tertiary education enrolment rate of any world region – a fact that limits to attain many SDGs. As a response to this, African tertiary education has rapidly increased the number of enrolments resulting in high figures of student-teacher ratios and thus negative consequences on educational quality and moreover low graduation rates; all of that is labelled as so called massification. Another recent phenomenon has been the growth in private higher education and the high share of elite students enrolling outside Africa. Several corrective measures to the consequences of massification have been new institutions and quality assurance systems (Mohamedbhai 2014). It seems that forestry education has not been influenced of massification as much as some other disciplines because student enrolment is limited and the desirability of forestry education has declined. Other trends in African tertiary education have been the restructuring of university courses, the gradual shift of employment opportunities for foresters away from the public to the private sector, and the increasing cost of gaining a university qualification (Temu & Kiyiapi 2008).

A major concern in African higher education is also gender inequity (Dessie & Tadesse 2015). The ratio of female to male enrolment, Gender Parity Index (GPI), for Sub-Saharan Africa has been the lowest of any world region, 62 female students for every 100 male students enrolled (Mohamedbhai 2014, See WB/UNESCO Statistics, FAO 2018b, p. 23). Other challenges are the use of European non-mother languages at universities, high tuition fees, and frequent closure of campuses and as a result of that student dropouts.

Forestry education has always been low in the lower agenda of the African politicians and policy-makers. A major prerequisite, however, will be recognition by policy-makers of the importance of forest product value chains in Africa's development. Recently, the importance of forests for sustainable development is increasingly being recognised, not only as a source of wood and timber, but also for carbon sequestration, as a source of renewable energy, for cultural and spiritual values, and recreation, among others (Schoene & Bernier, 2012, Traore & Tieguhong 2018).

A number of areas where African forestry education needs to be changed has have been identified. Temu and Kiyiapi (2008) listed a few points: restructuring forestry education and practice to address environmental and

other cross-cutting issues such as food security and poverty, including the management of shrub lands and areas with low forest cover in forestry education, reinforcing courses in forest governance and ethics, initiating a global mechanism to stimulate stronger investment in forestry education, particularly the re-training of educators, review of curricula and development of new and relevant learning resources, making forestry education strategic and relevant to youth and women through well-integrated programmes that reflect the broadened mandate of forestry, strengthening human resources capacity in the management of trees outside forests, especially urban forestry, and improving collaboration between higher institutions.

There have been some revisions of curricula. Unfortunately, these changes have usually been ad hoc, as opposed to the result of conscious processes and interactions needed to produce robust forestry programs (Temu et al. 2005). One of the profound and effective education development project has taken place among Congo basin countries. Network to the Central African Forest and Environmental Training Institutions (RIFFEAC) and other relevant stakeholders have been target for this International Tropical Timber Organisation (ITTO) funded project since 2007. The aims have been among others to update training modules relating to sustainable management of forest concessions and to further educate trainers of education institutes (ITTO 2010).

A specific challenge has been that students get limited opportunities to engage with practical farming and local communities, which is necessary to acquire a deeper understanding of the dynamics of rural areas. Also, there is a lack of adequate exposure to larger agricultural producers and value chain actors such as processers and exporters. While most sub-Saharan African countries have moved towards placing a central emphasis on the private sector as the central driver of economic growth, most tertiary agricultural education (TAE) curricula have not been revised accordingly. The private sector thus has limited incentives to invest directly in TAE (Yaye et al. 2017).

Several education development projects in Africa have been running over the years. UNEP supported MESA network has been working 2004-2014 and has had members in over 85 universities in 30 African countries. MESA had three pillars: education, training and networking. One of the outputs being Education for Sustainable Development Toolkit (UNESCO 2006). Since 2015 MESA experience has been scaled up to the global level through the Global University Partnership for Environment & Sustainability (GUPES), a network of over 500 universities. In Africa a special project the African Environmental Education and Training Action Plan (AEETAP) is launched. However, the role of forests in this plan is not clear.

The future of African forest tertiary education has four aims (Mohamedbhai 2014). First, to ensure equity, in particular gender parity; Second, more support to be given to all the enrolled students, especially those who experience difficulties in adapting to the higher education environment; Third, keep with the quality standards especially in the case if new universities are established to ensure the resources for new and already existing universities; Fourth. ensure that teaching and research are relevant to respective country's needs.

**Americas**

The state of forest tertiary education varies a lot in Americas. The status of forest education in North America is more or less equivalent comparable to Europe whereas the status situation of Latin America is different. The most important factors behind forest education trends in the US are recently explored to behave been identified as follows: (1) changing social values as forestry has been associated with negative image, (2) diversification of degree offerings beyond traditional forestry; (3) inflexible, science-based curricula associated with accreditation and certification; (4) a perceived lack of forestry jobs and low wages; and (5) limited attraction to forestry for women and minorities (Sample 2015, Sharik et al. 2015). In North America the number of forestry education programs as well as independent forestry institutes has decreased in recent decades – a trend akin to

Europe. At the same time multidisciplinary programs have become dominant. Classification of Instructional Programs (CIP) has eight forestry titles, such as "Forestry, General" and "Forest Sciences and Biology". In addition, to those there are more than 20 forest related natural resources and conservation program titles (Sharik et al. 2015).

The education systems, however, are different in all three countries and there are several models for masters' level education (Innes 2015). In Canada, for instance, tertiary education has taken place for lower vocational oriented (180-420 graduates/year) and upper academic oriented levels programs (300-600 graduates/year) (Bernasconi & Schroff 2011).

In the US, the enrolment figures have been highly cyclical, with variation nearly 50% in a decade, and they have shifted from traditional forestry to more interdisciplinary and ecosystem based programs. Furthermore, female and minority enrolments have steadily increased but still being below average in all undergraduate population (Sharik et al 2015). Need for curricula revisions, similar to many other regions, are related to shortcomings of social science education in forestry, especially conflict management, communication in the workplace and with clients and the public (Sample et al 2015, Bullard 2015).

In Latin America (LA), the situation is somewhat different than in North America. Several LA countries have been expanding in particular the activities of plantation forestry, and the need for labour has been therefore increasing. Another increasing topic has been a need to protect biodiversity in nature conservation areas through PES schemes. (see section secondary education).

Guariguata & Evans (2011) have proposed the lacking elements in Forestry curriculum in LA being first; how to engage with local stakeholders; second, lack of technical and economic aspects of multiple-use management; third, lack of participatory approaches to forest resource use; and fourth, to respond more effectively to global forestry paradigms. According to Guariguata & Evans (2011) in the hearth of all these challenges is how to manage non-timber forest products (NTFPs).

**BOX 8. SAF curricula standards surveyed.**

Probably, it is not an overstatement to say that standards by the Society of American Foresters (SAF) are unifying and harmonizing forestry education in US more than any other standards in any other region. Accreditation is seen useful as a mechanism for assuring the public that programs deliver appropriate learning outcomes, challenging universities to periodically re-evaluate curricula, and helping programs communicate their needs to higher administration (Redelsheimer et al. 2015). A survey with a special focus to HR and general competencies are presented.

A content of Accreditation handbook is as follows (SAF 2016):

PREFACE ..... 4
INTRODUCTION ..... 6
Section I. CANDIDACY AND ACCREDITATION PROCEDURES ..... 8
CANDIDACY ..... 8
Candidate Eligibility Review ..... 8
Candidate Status Requirements ..... 9
Representations to the Public ..... 9
ACCREDITATION ..... 9
Procedural Overview ..... 10
Accreditation Timeline ..... 10
Self-evaluation ..... 12
Site Visit ..... 12
Accreditation Committees' Review and Decision ..... 17

Accreditation Period ..... 19
Substantive Change Reports ..... 19
Fees ..... 20
Voluntary withdrawal from accreditation status ..... 21
Voluntary withdrawal from accreditation process ..... 21
Appeals ..... 21
Complaints against candidate and accredited programs ..... 22
SECTION II: STANDARDS FOR ACCREDITATION ..... 24
STANDARD I: PROGRAM MISSION, GOALS, AND OBJECTIVES ..... 24
STANDARD II: PROGRAM ORGANIZATION AND ADMINISTRATION ..... 24
Administrator ..... 24
Student Recruitment, Admissions, and Transfers ..... 24
Teaching ..... 25
Administrative Support ..... 25
Program Planning and Outcomes Assessment ..... 25
Representations to the Public ..... 25
Provision of Reliable Information to the Public on Performance ..... 25
STANDARD III: STUDENTS ..... 26
Student Life ..... 26
Recruitment and Retention ..... 26
Advising ..... 26]

STANDARD IV: PARENT INSTITUTION SUPPORT ..... 26
Program Support ..... 26
Supporting Programs ..... 26
Physical Facilities ..... 26
STANDARD V: CURRICULUM ..... 26
**FORESTRY**
General Education ..... 27
Professional Education ..... 28
**URBAN FORESTRY**
General Education ..... 30
Professional Education ..... 31
**NATURAL RESOURCES AND ECOSYSTEM MANAGEMENT**
General Education ..... 33
Professional Education ..... 34
**FOREST TECHNOLOGY**
General Requirements ..... 36
Technical Education ..... 37
STANDARD VI: FACULTY ..... 38
**FORESTRY**
Academic and Professional Competency ..... 38
Teaching Skills ..... 39
**URBAN FORESTRY**
Academic and Professional Competency ..... 39
Teaching Skills ..... 39
**NATURAL RESOURCES AND ECOSYSTEM MANGEMENT**
Academic and Professional Competency ..... 40
Teaching Skills ..... 40
**FOREST TECHNOLOGY**
Academic and Professional Competency ..... 40
Teaching Skills ..... 41
Section III: GUIDELINES FOR THE SELF-EVALUATION REPORT ..... 42
INTRODUCTION ..... 42

SUGGESTIONS FOR PREPARING THE SELF-EVALUATION REPORT ..... 42
OUTLINE OF INFORMATION REQUIRED IN THE SELF-EVALUATION REPORT ..... 43

**Asia and Oceania**

Asia and Oceania is such a large area in terms of diversity of environmental and social aspects. It is thus evident that tertiary forest education also varies greatly from country to country. The most urgent forestry challenges in the region are deforestation and illegal logging. Of all harvesting around half is still estimated to come from illegal sources (Kleinschmit et al. 2016).

Despite the heterogeneity of the area, commonly shared changes and trends in higher forest education in Asia-Pacific indeed exist and they have many similarities to North America and Europe. Education has, for instance, evolved to from a resource-centred to a more integrated multidisciplinary approach. Forestry-related programs are also linked more often to environmental science and responding to international policy agendas such sustainability development (APFNET 2018).

According to up-to-date survey by APFNET (2018) there are now 190 universities (couple of these are in US and Canada) in the Asia-Pacific region offering more than 510 forestry-related programs, with more than 124,000 students enrolled. New forest-related programs have also been recently developed, such as urban forestry, ecotourism and environmental services, parks, recreation and tourism, and geomatics for environmental management.

It is worth considering the largest country in the region and globally, China, as a separate unit. According to Chinese forestry database (http://cfdb.forestry.gov.cn) there were in 2014 more than 330 undergraduate and post-graduate forestry units in China. Of these 6 are in the post-graduate level with a special status of “Forestry University”, 76 are “Forestry Institutes” and in the undergraduate level there are 250 universities or institutes offering forestry curricula. In 2014, the total number of graduates in post-graduate level was around 7,400 and in the undergraduate level around 41 000.

Some of the main findings in the Asia Pacific region by APFNET (2018) were :

- student enrolment in general has increased recently, some more competition existing with more environmentally oriented programs
- faculties and departments are merging (like in Europe and Americas)
- more students are seeking post BSc education to meet increased requirements in labour markets
- quality of education is sometimes critical, the number of educated professors being limited and faculty focusing more on research

Changes in labour markets, economies, and policies are setting new demands for forest education. APFNET (2018) proposed cooperation and standardization as a solution for these pressures. In practical level this would mean exchange programmes, standardization of course materials and common online courses.

- enhance the quality of student learning
- provide more accessible education through exchange
- financial support
- online courses

According to APFNET (2018) survey respondents (24 universities) expressed their desires to strengthen international collaborative efforts and to share curricula and resources. The report emphasized that universities could develop more standardized courses and curricula, a way to more easily mutually recognize courses abroad.

Collaborative teaching efforts can also help increase the capacity of tertiary education in the region. As concrete examples towards this benchmarking exercises were proposed. “Building from information gathered from highly-ranked forestry programmes allows those universities looking to strengthen curriculum an efficient way to do so“, stated APFNET (2018). Another related suggestion was so called internationalization at home. That is, for those students and faculty members that are not able to travel internationally, e-learning materials are to be developed.

**Europe**

Much of the common trends and driving forces in forest education are already stated in previous sections. In Europe challenge is especially students’ decreasing interest in pursuing forestry careers (Pohlschneider & de Lima 2016, Green Jobs 2018). Thinking about the changes in curricula are those same issues already mentioned such as decreasing the number of independent forestry/forest sciences programmes. However, there are also certain specialities in curricula development that has happened in Europe since the Bologna declaration in 1999.

The harmonization of degree programmes, so called Bologna process, is one of the most influential projects among European Union education policies (http://www.ehea.info/cid100210/ministerial-conference-bologna-1999.html). The Bologna Process is a series of ministerial meetings and agreements between European countries - not only EU member countries - to ensure comparability in the standards and quality of higher-education qualifications. It is named after the University of Bologna, where education ministers from 29 European countries signed the declaration in 1999. The basic framework is three cycles of higher-education qualifications: three year BSc, two year MSc and four year Phd cycles. The Bologna system is also in use several countries other than the EU members, for instance in Ukraine and Russia (Alekseev et al. 2012).

The idea of harmonization defines the qualifications in terms of learning outcomes: statements of what students know and can do on completing their degrees. In describing the cycles, the framework uses the European Credit Transfer and Accumulation System (ECTS). This harmonization procedure aims to the situation that is basically using the same idea that APFNET (2018) was discussing (see section tertiary education in Asia and Oceania).

The effect of Bologna process on several aspects of European forest education has been multidimensional (Silva 2014). Thinking about the curriculum alone is a complex issue. One of the main concerns was that labour markets seem to have reluctance to accept new BSc graduates. There were strict opposition against curricula specialization by the public sector which were more fixed in traditional career paths in governmental forest service. On the contrary, labour markets have been calling for more diverse study programmes especially when it comes to the private sector. Lewark (2015) concludes with the statement of the evolution of European forest curricula: “The times of forestry faculties with just one study programme, which were traditionally found in many European countries, are obviously over after the implementation of the requirements of the Bologna process.”

### 3.6 Non-formal, Informal, and life-long learning

Non-formal learning is not bound to formal curricula and studies in educational institutes but it takes place while working and during leisure time through several forms such as experiential learning. In general, it can be classified into three categories such as implicit, reactive, and deliberative learning (Eraut 2000). Implicit learning is a phenomenon where the acquisition of knowledge is independently of conscious attempts to learn. Reactive learning is near-spontaneous and unplanned, however, learner is aware of it but the level of intentionality varies, whereas with deliberate learning time is specifically se aside for that purpose.

Because non-formal learning is not taken place in educational institutes it is better than formal learning in reaching marginalised groups such as women and minorities (Redmore and Tynon 2011). Non-formal co-

learning approaches such as farmer field schools can be effective in particularly for those who are vulnerable, such as smallholder farmers. These types of learning could be effective for people not reachable by formal education institutions, and it can be a way to social learning and local adaptation to social, technological, and environmental changes (FAO 2017). There are also programmes that enhance non-formal forest related learning in urban settings, for instance, Chicago's long-established "Treekeepers" community engagement programme (Dwyer and Schroeder 1994) and Singapore's "Community in Bloom" and "Community in Nature".

Informal science education (ISE) provides opportunities to increase public science literacy. ISE can be delivered via numerous venues including lectures, websites and projects that are experienced in homes, schools, and science centres (Bonney et al 2009). In spite of the term "informal" it is justified to see ISE more like non-formal than informal mode of learning. Numerous other forest related non-formal learning programs and materials exists, such as MOOC platforms, LinkedIn courses, Education for Sustainable Development (ESD) Innovation's Toolkit 2006, and webinar platforms.

According to Garrick (2012) informal learning is often see as a part of experiential learning and should not thus be seen completely different from formal learning. Informal learning happens as a part of every-day life, for instance, a child learns attitudes and behavioural models directly and indirectly from parents and other people nearby. Other informal learning related concepts are authentic learning, experiential learning, incidental learning, and workplace learning (Garrick 2012, Andersen et al 1995).

Traditionally, some NGOs and community groups have been effective context of informal learning and they have sometimes been powerful forest-related institutions. For example, community-based forest restoration programmes have had an impact on reducing deforestation or enhancing responsible consumption (Boyer-Rechlin 2010). Like with non-formal learning there is in urban settings informal forest related context. Gardens and green areas can be important source of non-formal learning for city dwellers and these areas have also shown to affect positively people's physical and mental health (Dzhambov et al. 2018, Tyrväinen et al. 2014).

Nowadays, the role of social media is influential in many ways. It can be public policy driven such as government organizations´ innovative use of Twitter activity in South Korea (Cho & Park 2012). However, it is mostly about non-governmental and spontaneous communication and exchange of knowledge. Andersson & Öhman (2017) stated that social media can be highly influential learning element in young people's environmental and sustainability issues. However, they argued that research of social media in this context is lacking.

In general, social media and communities therein can provide effective means of improving scientific literacy (Robelia et al. 2011). A specific way of engaging laymen's attention to research is citizen science. Nearly 30 years thousands of citizen science projects have had millions of participants in collecting and/or processing data of all kind. Bonney et al. (2016) found limited but growing evidence that citizen science projects enhance knowledge about science and increase public awareness of the diversity of scientific research. Citizen science may also provide deeper meaning to participants' hobbies.

### 3.6.1 Life-long learning

Life-long learning (LLL) is conceptually diverse mode of learning including formal, non-formal and informal learning. Aspin & Chapman (2000) listed three dimensions of LLL: firs, for economic progress and development; second, for personal development and fulfilment, and third for social inclusiveness and democratic understanding and activity. LLL is today increasingly being mobilized to address the global environmental crisis and accompanying

sustainability challenges (Wals and Benavot 2017). Informal learning, for instance via social media as a form of social capital, may have a significant role in professional development. Sustainable Development learning needs both theoretical conceptualization and hands-on practical experiences. Connections to a day-to-day personal lifestyle where informal learning occurs is a vital factor to improve SD literacy teaching and learning (Starcic et al. 2018).

One important innovation in informal LLL is the Massive Open Online Course (MOOC) concept which emerged at the beginning of the century and was introduced to public arenas in 2012. Different versions of MOOCs and MOOC platforms exist in relation to openness, profit-orientation and the student connections utilized during the course. The most well-known non-profit platforms are Khan Academy and edX and for-profits platforms Udacity and Coursera. Most popular courses are about math, science especially computer science and business.

In US Natural Resources Distance Learning Consortium (NRDLC) provides more than 200 different online courses in natural resources. However, a small part of these courses are directly forestry courses (http://www.forestrywebinars.net/).

There are only a few MOOCs related to forests so far, one of the biggest provider in English being Asia-Pacific Forestry Network (APFNet). Some more forestry MOOCs are available in Chinese platform (Youqing 2018). Some of the websites to find out forest-related MOOCs are Global Forest Information System (GFIS) and International Forestry Students' Association (IFSA). To improve the effectiveness of MOOCs (now very low completion rates) social engagement is needed. This can be done through peer-to-peer and peer-to-teacher discussion and involvements. MOOCs can bring the university lessons to students who need it most and could not be able to travel to reach university (Laurillard, D. and Kennedy, E. 2017).

Within forest education courses that can be easily organised as online courses are those without mandatory fieldwork, such as forest economics, forest policy, forest management, and statistics. Other courses with a significant field component such as forest ecology, silviculture, or forest operations, may be best managed as hybrid courses (Standiford 2015).

Even though online courses are not going to replace all traditional lecture-laboratory type traditional instructions there are many pedagogical and technological issues related to online learning that will also change the way more traditional teaching is going to be made in the future. The best way is to think about what online learning will provide: the benefits of flexibility in scheduling, location, and cost. All this can be increased in traditional teaching by using videos, podcasts, online material, and assignments. So called flipped classroom model is a typical example of intentionally using all of these.

There is an ever increasing supply of informal online education at all levels. From mobile application stores it is possible to find thousands of small apps for how to learn math or languages. Some apps are more like platforms providing several courses or learning management systems (LMS). Some of the most widely used of them are in addition to earlier mentioned MOOC platforms e.g., Google Classroom, Great Courses, Quizlet, LinkedIn Learning, TED, and Duolingo.

A list of existing forest-related free learning materials and course are in Annex. This type of information is changing rapidly and it is difficult for teachers and students to keep on track. One challenge is the quality of the (free) learning / education material in mobile apps and on internet. There are organizations to do accreditation of these informal learning systems such as Kokoa Standard (see www.kokoa.io).

## Summary

This section summarizes the observations on forests in education vis-á-vis SDG4 (Education). The different forms of forest related education are interacting with SDG4. The summary thus takes into account education in all levels, that is, elementary, secondary, and tertiary. It is unambiguous that this kind of summary is highly subjective. Table 6 shows the current situation of forest related education vis-á-vis SDG4 and its regional trends. It is summarized here that situation is sufficient in Africa, good in Latin America and Asia and Oceania, and excellent in Europe and North America. A trend was recognised only in Africa and Asia and Oceania where it is seems to show improving situation.

**Table 6. Summary of forest in education vis-á-vis SDG4 and its regional trends**

| Region | SDG4 (targets T1-T10) | Trend |
|---|---|---|
| Africa | * | ↑ |
| Latin America | ** | - |
| North America | *** | - |
| Asia and Oceania | ** ↑ | ↑ |
| Europe | *** | - |

Current situation sufficient=*, good=**, excellent=*** and trend ↑ = improving, ↓ = weakening

### 3.6. Public and consumers' awareness on sustainable consumption and production of forest products

#### 3.6.1 Background

The status of the per capita material footprint in the world is uneven: developed countries have at least double the per capita footprint of developing countries. In particular, the consumption of fossil fuels is more than four times higher for developed than developing countries. As an indication of the increasing awareness of sustainability in production and consumption are the pieces of facts that first, by 2018, a total of 108 countries had national policies and initiatives relevant to sustainable consumption and production, and second, more than 90 per cent of the world's 250 largest companies are now reporting on sustainability (UN 2018).

Agriculture, forestry, and fishing altogether produces only 3.5 per cent of value added global Gross Domestic Production (GDP) (World Bank data 2015 https://data.worldbank.org/indicator/). However, forests and trees contribute to food security and other basic livelihoods of up to one billion people (Agrawal et al. 2013). Forests cover 31 and agriculture 37% of global land area. forests and forested wetlands supply almost 75% of the world's fresh water, and agriculture accounts for almost 70% of global water withdrawal and this share is projected to increase.

Key concepts of sustainability in agricultural production are water pollution and scarcity (so-called energy-food-water nexus), soil degradation, eutrophication of water bodies, loss of biodiversity, fertilizer and pesticide problems. The link between deforestation and food production through converting forests into agricultural land is generally well-known. In order to limit the scope and provide more focusing information this section is concentrating on sustainability of forest products, whereas agricultural production is considered only when it is directly linked to forest production. =

#### 3.6.2 Production of Forest Products

Of all forests around 60% are used for productions of wood and non-wood forest products (NWFP). In addition to products forests contribute to many non-tangible services such as regulation on cultural ecosystem

services (FAO 2018). Total round wood production was around 3 700 mill m3 of which wood fuel, including charcoal, accounts for about half and industrial roundwood for the other half (FAO 2017). Most wood fuel is used in its country of production, particularly in rural areas and in developing countries. The rest of wood is used for industrial products such as pulp, board, paper, lumber, plywood. The trade of wood products has been changing recently due to economic conjunctions and the change of regional consumption patterns.

FAO defines NWFP as being "goods of biological origin other than wood derived from forests, other wooded land and trees outside forests." Examples of NWFP include products used as food, fibres, resins, gums, and plant and animal products used for medicinal, cosmetic or cultural purposes. Data on production and consumption and also on trade of NWFPs is mainly lacking. Some estimates of the NWFPs production are provided such as US$88 billion in income world-wide (Brack 2018), though this probably an under-estimate.

The world's forest area has continued to shrink, but the pace of forest loss has slowed by 25 per cent since 2000-2005 (UN 2018). However, one may say that forest loss remains unsustainably high and the progress here has been uneven (Brack 2018). The major reasons globally for improved situation are certification schemes and especially increasing focus on illegal logging. Individual companies slowly began to adopt responsible purchasing policies – frequently under pressure from environmental NGOs and in general in the awareness of general public (Brack 2018). From the late 2000s the new legislation such as the US Lacey Act and the EU Timber Regulation also strongly reinforced these developments.

Topical targets of this report is to use SDG4, SDG10, SDG16, and SDG17 and the more detailed targets set out in the UN Strategic Plan for Forests 2017–2030, Global Forest Goals GFG3.3, GFG 5 (all targets), GFG 6 (all targets) to provide a comprehensive framework of analysing the status of production and consumption of forest products

*GFG3.3 The proportion of forest products from sustainably managed forests is significantly increased.* The status of GFG3.3 can be assessed using the FAO (2018) report:

Data provided by the FSC and PEFC certification systems show that the forest industry has recently made significant progress in improving sustainability, and use of products from sustainably-managed forests is increasing (FAO 2018, p. 50). The proportion of forest area under long term forest management plans increased to 2.1 billion hectares by 2010. Forest area under independently-verified forest management certification schemes - accredited by independent bodies in compliance with national and international standards - increased from 285 million hectares to 440 million hectares between 2010 and 2014 (FAO 2018 60).

Three-quarters of the globe's accessible freshwater comes from forested watersheds and some 40 percent of the world's 230 major watersheds have lost more than half of their original tree cover. However, the area of forests managed for soil and water conservation has increased globally over the past 25 years, In 2015 a quarter of forests were managed with soil and/or water conservation as an objective (FAO 2018, 13)

*Global forest goal 5. Promote governance frameworks to implement sustainable forest management, including through the United Nations forest instrument, and enhance the contribution of forests to the 2030 Agenda for Sustainable Development*

5.1 The number of countries that have integrated forests into their national sustainable development plans and/or poverty reduction strategies is significantly increased.
Status: no data available.

5.2 Forest law enforcement and governance are enhanced, including through significantly strengthening national and subnational forest authorities, and illegal logging and associated trade are significantly reduced worldwide
Status: About forest law enforcement no data available. Illegal logging is widespread across all tropical forest regions and illegal timber trade is primarily associated with tropical hardwood. Since 2000, the import share of primary and secondary wood products at high risk of illegality has decreased. However, no persistent declining trend in total volume of illegal imports by these countries has been observed (Kleinschmit, et al . 2016).

5.3 National and subnational forest-related policies and programmes are coherent, coordinated and complementary across ministries, departments and authorities, consistent with national laws, and engage relevant stakeholders, local communities and indigenous peoples, fully recognizing the United Nations Declaration on the Rights of Indigenous Peoples14
Status: No data available.

5.4 Forest-related issues and the forest sector are fully integrated into decision-making processes concerning land use planning and development
Status: No data available.

*Global forest goal 6. Enhance cooperation, coordination, coherence and synergies on forest-related issues at all levels, including within the United Nations system and across member organizations of the Collaborative Partnership on Forests, as well as across sectors and relevant stakeholders*

6.1 Forest-related programmes within the United Nations system are coherent and complementary and integrate the global forest goals and targets, where appropriate.
Status: No data available.

6.2 Forest-related programmes across member organizations of the Collaborative Partnership on Forests are coherent and complementary and together encompass the multiple contributions of forests and the forest sector to the 2030 Agenda for Sustainable Development.
Status: No data available.

6.3 Cross-sectoral coordination and cooperation to promote sustainable forest management and halt deforestation and forest degradation are significantly enhanced at all levels.
Status: No data available.

6.4 A greater common understanding of the concept of sustainable forest management is achieved and an associated set of indicators is identified.
Status: No data available.

### 3.6.3 Consumption of Forest Products

Sustainability of forest products consumption are due to several drivers such as economic development, population growth and demographic changes, and changing consumption patterns. Global wood consumption (converted to raw material) is based approximately half for fuel wood and half for industrial wood products. The most fuel wood is consumed in domestic markets of which the largest are in Brazil, China, Congo, Ethiopia, and India. The biggest consumption countries and regions are China, US, and EU. The global consumption of wood products increased steadily from 2000 to 2006 and then due to global financing crisis especially sawn timber consumption dropped, after that it has been recovering slowly.

### 3.6.4 Public awareness of impacts of agricultural consumption and production on forests

Consumers' power on companies is well acknowledged in several cases where special campaigns have taken place, for instance, boycotts against Nestle and McDonalds (Denegri-Knott 2006). Some of these campaigns have begun as an environmental movement. Moreover, there is some evidence that it is not just environmentalist groups who struggle against producers, but also the regular, individual consumers. For example, a majority of UK consumers have been prepared to take action against companies that do them wrong and 84% expect companies they use regularly to listen to their opinions (Henley Centre 2000). An interesting question in this consumers-producers framework is the base on which consumers are making their decisions on consumptions and activism. There are several studies of some food products and companies and the (sustainability) perceptions that consumers attached to those.

An appropriate example related to forests and food production is palm oil. Especially among North American and European consumers palm oil industry is seen as unsustainable, since it is responsible for high levels of pollution from practices and processes, and producing deforestation and biodiversity loss (Aguiar et al. 2018, Gunstone, 2011). In producing countries, on the contrary, there is the perception that the palm oil industry has improved local people's lives and economic development. Interestingly, at the same time when people have knowledge that acting as consumers they have the impact on the palm oil industry, they would not stop consuming products with palm oil as ingredient. Therefore, people may tend to be ignorant about the ingredients in the products consumed.

### 3.6.5 Public awareness of forestry and forest products

Forest certification is a method that has invented to raise consumers' awareness of sustainable forest management (see section 4.2.2). The world's two major forest certification schemes are the Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC). The total global certified forest area, with double-counting subtracted, was around 430 million hectares in 2017. Certified forests provide about one-third of the global industrial round wood supply (UNECE 2018). The major challenge with forest certification has been that it mainly operates in boreal forests, not in tropics where the most of deforestation takes place (Rametsteiner & Simula 2003, Breukink et al 2015).

Certification programmes also raise the awareness of sustainability in production and manufacturing. This chain-of-custody (CoC) certification is common and continues to grow, it tracks forest products through production and manufacturing to end-consumers via chains of custody helping inform consumers about sustainable development (UNECE 2018).

Public perceptions and awareness of sustainability of forestry and forest products can be related to several forest management attributes and different products; in principle awareness of all forest ecosystem services and their production chain. In (social) psychology perceptions and awareness are mostly related to someone's observations on something or state of being conscious and are thus judgement or value free concepts (Ajzen 1991, Chalmers 1996). Furthermore, perceptions and awareness are prerequisites for attitudes, acceptability and legitimacy people may attach to any objects such as production or products. These concepts are frequently examined together as can be seen from the following studies to be introduced.

Industrial plantations and their future role globally has been the object of heated debate for a while (Bauhus et al., 2010; Gerber, 2011; Rudel, 2009; Schirmer et al., 2015). D'Amato et al. (2017) examined interview data on plantation-based forestry in southern China. Some negative development on environmental quality, especially on soil and water, after the establishment of the industrial plantations was mentioned by most interviewees. Furthermore, forest plantations had an effect on local people so that they switch from agricultural

crops to household plantations. It was perceived that household plantations can provide owners more free time, higher income, while industrial plantations provided some employment opportunities. Interviewees' expectations for the future included receiving financial support and capacity building for household plantations and crops.

Western et al (2017) examined the social acceptability of forest biomass harvesting in the context of forest fire management. Four factors related to acceptability judgments were identified: protecting and conserving ecosystem health and wildlife habitat, supporting local wood products industry, supporting biomass utilization to reduce waste, and protecting and sustaining multiple use. Some of these values were found to be conflicting with each other and acceptability of the biomass harvesting was also conditional on other values.

Stern et al. (2018) examined 13 current and new bioeconomy-related products and services using questionnaire data from four European countries. Results showed that respondents were in the strongest agreement that the forest sector has since the year 2000 produced innovations related to wood building systems, construction materials, and wood composites. However, in the next 15 years they expect a decline in innovations related to biofuels and paper products. The observed variation in perceptions called for better communication to improve societal awareness of ongoing innovation projects.

### 3.7 The role of formal and informal education in public awareness

It is first worth mentioning UNESCO coordinated the Education 2030 Agenda and the follow-up the Global Action Programme (GAP) as part of a global movement to eradicate poverty through 17 Sustainable Development Goals by 2030. GAP has five priority areas: 1) the crucial role of political policy in advancing a favourable environment for education for sustainable development, 2) The holistic transformation of learning and training, 3) building the capacities of educators and trainers, 4) enabling and mobilizing youth, and 5) advancement of sustainable development at the local level (Michelsen & Wells 2017). The role of knowledge, information, and education in attaining sustainability development are examined in the following in elementary and tertiary education and in the context of consumer and citizen behaviour.

The effect of any education on consumption patterns in general and wood consumption especially is slow. On elementary education level the positive effects of forest pedagogy on young people may have life-long effects and decrease so called nature deficit disorder. There are increasing research-based evidence that contacting nature reduces stress, obedience, allergies, diabetes, and other health problems (Kabisch et al 2017, Van den Bosch, 2018 Louv 2006). However, there is a lot to do that awareness of this evidence is to be widely shared and forest pedagogy approaches would spread globally.

Implementation of higher education for sustainable development may include several actions According to Michelsen & Burandt (2017), as a first step, specific course modules on sustainability or modules with the methodology of education for sustainable development can be established. Next, there is an opportunity to also change whole curricula, and finally even whole universities, so that they can better follow the demands for sustainable development. It is worth mentioning that due to the complexity of the field of sustainability no discipline alone is able to provide adequate framework but inter- and transdisciplinary approaches are needed.

Among general public, citizens and consumers the concept of *social learning* is crucial (Wals 2017). In order to address the prevailing unsustainability, people with all ages need to become active participants in transitions from prevailing behavioural patterns founded on untenable principles and values. This transition demand more emphasis to be placed on transformative social learning. The reframing of social learning is crucial on the one hand with emphasizing the need for non-consumerist values, and on the other hand modifying economic interests and the neo-liberal agenda as far it has unsustainable features (Wals 2017).

Public and consumer awareness of forest loss, changes in policy and consumption patterns are interlinked. The best example of this being the decrease of forest loss in Brazil (Hansen et al. 2013). Product labelling system is a relatively new method to raise consumers' knowledge and information base in sustainability. These labelling systems can be seen as an informal way of consumer education. In an exceptionally large survey study, where data came from six European countries, Grunert et al. (2014) investigated the relationship between consumer motivation, understanding and use of sustainability labels on food products. At the general level respondents expressed medium-high to high levels of concern with sustainability issues. In the context of concrete food product choices, however, their expression was in the lower levels of concern. Understanding of the concept of sustainability was also limited, but understanding of four selected labels was somewhat better. Moreover, the results implied that these labels did not play a major role in consumers' food choices. The study concluded that future use of sustainability labels will depend on the extent to which consumers' general concern about sustainability can be turned into actual behaviour.

# 4 Fostering effective, accountable and inclusive forest institutions

The cornerstone to achieving peaceful and inclusive societies lies in effective governance through robust and transparent institutions and the rule of law. This section deals with key drivers to advance SDGs 10,16 and 17 as well as GFGs 5 and 6. It analyses multilevel forest governance and its complexity from the perspective of participatory forest management and land use decision-making. It also addresses the essential elements contributing to stronger institutions, including access to information, market-based interventions to curb down illegal logging and trade, cross-sectoral coordination and cooperation to synergise SDGs implementation and manage potential trade-offs, and monitoring and accountability mechanisms.

## 4.1 Enhancing participatory and transparent forest management and land use decision-making

This section investigates the leverage points to advance participatory forest management and land use decision-making within the framework of the 2030 Agenda and the UN Strategic Plan for Forests 2017-2030. A multi-level perspective is adopted to include international, national and subnational perspectives. Over the last decades, substantial progress has been made in democratic decentralization and the creation of participatory governance models enabling effective participation at national and subnational levels. These efforts need now to address the issue of equality and further inclusive institutions that enable meaningful participation of vulnerable stakeholders like women, youth, indigenous peoples and peasants. Effective participation also requires public access to information allowing to grasp the multiple dimensions involved to make knowledgeable forest management and land use decisions.

### 4.1.1 Promoting participatory governance platforms and decentralization processes

Participation is a human right recognized under the International Covenant on Civil and Political Rights (ICCPR) and the International Covenant on Economic, Social and Cultural Rights (ICESCR). It also relates closely to SDG 16 targets 16.6, 16.7 and 16.10; GFG 5 targets 5.2, 5.3 and 54; and GFG 6 targets 6.3, 6.4 and 6.5. All peoples have the right of self-determination and to freely pursue their economic, social and cultural development (Article 1, ICESCR and ICCPR). Furthermore, every citizen has the right and opportunity to participate in public affairs (Article 25, ICCPR). This right is complemented by the rights to freedom of expression, access to information (see 3.7, 4.1.4), freedom of association and assembly, among others.

Democratization in forest landscapes management requires effective involvement of local stakeholders in decision–making processes through the creation of enabling spaces for participation (Steins & Edwards 1999,

Cornwall 2002, 2008, Cornwall et al. 2011), which are translated into participatory governance structures. Agrawal and Ostrom (2001) suggest that design principles to create spaces for participatory forest governance are key to enabling virtuous decision-making processes where local actors participate on a levelled playing field, regardless of local power asymmetries. National and subnational governments should create adequate legal frameworks and actively involve ensuring these principles are materialised. In Cameroon, the 1994 Forestry Law No. 94/01 promotes popular participation in forest management, sustainable forest management and the combat of poverty thus empowering local communities and creating a space for inclusion of formerly marginalised groups such as the Pygmies in Eastern Cameroon (Brown and Lassoie 2010).

Participatory community forestry arrangements can contribute to ending poverty (SDG 2), as in the case of the Livelihoods and Forestry Programme of Nepal, where poverty in the 54 community forest groups analysed reduced from 65% of households in 2003 to 28% in 2008, and very poor households decreased from 42% to 10% (RECOFT 2013). A study conducted in 84 sites in six countries of East Africa and South Asia established a positive correlation between local communities' active role in forest governance and outcomes on local livelihoods: forest communities exerting active control over forests presented a larger percentage of households covering a substantial part of their subsistence needs from forests (Persha et al. 2011 cited in RECOFT 2013). In Mexico, as much as 80% of the forests are managed by community forestry enterprises or indigenous communities under collective tenure arrangements, many of which provide good accountability, invest in sustainable forest management and fair distribution of benefits (Bray et al. 2003). Moreover, successful community forestry enterprises also use profits to build community assets (e.g. drinking-water supply, schools, health care facilities and old age pensions).

Edmunds and Wollenberg (2003) provide examples of institutional arrangements enabling forest management decision-making devolution to the local level:

- Formal business organisations (e.g. rubber tappers' organisations in Brazil, community forestry enterprises in Mexico, trusts in Botswana, conservancies in Namibia and communal property associations in Makulele in South Africa);
- Government-assisted village committees (e.g. Village Natural Resource Management Committees in Malawi, Forest Protection Committees in India);
- Local government organisations (e.g. rural district councils in Zimbabwe, *pachanyats* in India);
- Multi-stakeholder district structures aligned to departments (e.g. *tambon* councils in Thailand, wildlife management authorities in Zambia).

**Box 8. Family forest owners in Sweden**

About 50% of the forests in Sweden belong to private family forest owners, after a 100 years of land reforms and privatisations. They exercise strong local control and play an active role in decision-making and forest management. The government has light control or regulation over family forest enterprises, although they must allow the *Sami* people to herd and graze their reindeer, and public access for berry picking and outdoors activities. Approximately 110,000 family enterprises (nearly 50% of the total) are members of one of the four regional family forest cooperatives.

Source: The Forests Dialogue 2018.

Effective decentralization entails strengthening local authorities' capacity, representation and accountability. A large-scale study shows that in South and Southeast Asia, forest co-management systems that allow for more local autonomy and rule flexibility present low conflict levels while higher conflictivity occurs in cases with stringent state control, lack of specificity and permanence of property rights and unclear benefit sharing mechanisms and rule compliance (Shivakoti and Ostrom 2007). In Xinqi, China, considering the negative impacts of the division of their collective forest, the villagers decided to keep collective property and equitably share the benefits in a comparable way to community forest enterprises in Mexico. Xinqi Village Committee exerts the collective will of the community and persuaded the higher-level authorities to keep their successful forest management model where villagers freely collect fuelwood and NTFP and collectively sell timber on a regular basis (RECOFT 2013). The integration of traditional indigenous institutional arrangements into village-level forest governance produced effective allocation mechanisms to communities and individual community members in Indonesia and Vietnam (Shivakoti and Ostrom 2007).

Participatory forest governance platforms create spaces where grassroots democracy can thrive if small-holders and forest communities can exercise active influence in decision-making processes, e.g. Bolivia, Guatemala, Mexico, Nepal, Burkina Faso, Cameroon, Tanzania, Finland, Sweden, Canada and USA (Edmunds et al. 2003, RECOFT 2013, FAO 2018b, The Forest Dialogue 2018). One of the main challenges regarding democratic participation in forest governance is elite capture tied not only to wealth differentials, but also related to symbolic capital (e.g. social standing, power differentials) or ethnicity (Persha and Andersson 2014). National governments are key in curbing the risk of elite capture e.g. by creating a downward and upward accountable institutional arrangement and actively involving marginalised groups. Additionally, there is an opportunity to enhance forest governance institutional arrangements through partnerships with CSOs, as they may improve accountability and overall functioning (Persha and Andersson 2014). An example of upward and downward accountability is community forest management at the village level in the region of Kumaon, India. Since the 1930's the nearly 3,000 elected forest councils (*van panchayats*) have considerable decision-making powers within a flexible framework established by the national government and manage an average of about 50 ha of forests per village with rights that include harvesting and selling timber but exclude clear-cutting forest (Larson 2005, RECOFT 2013).

### 4.1.2 **Empowering women and youth for effective participation in decision-making processes**

*Advancing women participation in forest decision-making processes*

The trajectory of women empowerment is long and has important milestones along the way, such as the provision contained in Article 3 of the ICESCR and the ICCPR that mandates State Parties to the Covenant to "ensure the equal right of men and women to the enjoyment of all economic, social and cultural rights set forth in the present Covenant". Building upon these norms, the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) establishes that its States Parties shall take all appropriate measures to ensure the full development and advancement of women and guarantee them the exercise and enjoyment of human rights and fundamental freedoms on a basis of equality with men (Article 3). Moreover, governments must ensure women the right to participate in the formulation of government policy and its implementation (Article 7), while rural women have, among others, the right to participate in the elaboration and implementation of development planning at all levels (Article 14).

In Asia and the Pacific, women are still underrepresented in community forestry organisations in terms of membership and leadership. Paradoxically, women share with the men in their household the responsibility for forest management but do not have equal participation in the benefits (RECOFT 2013, Agarwal 2010). An assessment of 135 community forestry institutions in Gujarat, India, and three districts of Nepal reveals that: the

number of women in the executive committee (EC) directly influences women attendance to meetings and their voicing opinions; a dominant male president can silence women even if they are 30% of the EC, but a sympathetic one may empower them (Agarwal 2010). In the Lanao del Sur, Philippines, local government prepared a Forest Land Use Plan (FLUP) contemplating land tenure instruments that included individual property rights (IPR) to legitimate farmer-claimants. Women were enabled to apply and are about 20% of the legal owners. Also, in the case of married couples, both partners signed the stewardship agreement. Hence, women participate in land and forest decision-making (Aguilar et al. 2011).

**Box 9. Indigenous women participation in decision-making in Nicaragua**

In Latin America, women empowerment is advancing throughout the region as countries implement gender-sensitive policies, although more inter-agency coordination is desirable. For example, since 2010 Nicaragua carried out a National Gender Equity Program seeking to improve the situation of women, including the eradication of violence, education, access and control of productive assets and political participation. Moreover, the Gender Policy in the Context of Indigenous Peoples and Multi-ethnic Communities of the North Atlantic Autonomous Region (RAAN) aims at creating conditions for the effective empowerment of women and their insertion in the social, economic, political and cultural life, promoting their incorporation in decision-making processes. *Miskitu* and *Mayangna* indigenous communities are slowly evolving towards gender equity through awareness raising, better schooling and facilitation by external governmental organisations, from district to local level. As a result, women are increasingly becoming leaders and women participation in community meetings has increased. More work is still necessary to achieve women participation in natural resource management decision-making.

Source: Mairena et al. 2012.

Governments should continue mainstreaming gender-sensitive policies and create enabling conditions for women to meaningfully participate in forest decision-making processes, enhance equitable benefit-sharing and foster women leadership in forest-related organisations. Among the policy measures, it is essential to further education of women and girls (see section 3), create social awareness, eradicate violence against women, establish appropriate legal frameworks providing for women involvement in institutional arrangements and, when necessary, establish minimum quotas for women participation in decision-making bodies.

*Promoting youth engagement and empowerment*

According to the UN Secretary-General's Envoy on Youth[5], more than 500 million youth aged 15-24 live on less than US$2 a day, while 2 out of 3 countries do not consult young people as part of the process of preparing poverty reduction strategies or national development plans. Moreover, of 244 million international migrants, one-third are aged 15 to 34, and internal migrations were estimated at 763 million in 2013 (FAO 2016e). Rural youth is more likely to migrate due to economic distress, lack of infrastructures and decent jobs and the unattractiveness of agriculture. Rural youth migration needs to be dealt with to harness youth innovation potential and contributions to address challenges as inequality, deforestation and degradation and adaptation and mitigation of climate change. Youth also represent the future and continuity of many forest communities, and they may also create the next generation of SMFEs provided they are given opportunities to remain in their communities.

[5] URL: https://www.un.org/youthenvoy/hunger-poverty/ (Accessed: 12/05/2018).

The OECD (2018b) conducted a research in 39 countries regarding youth engagement and empowerment that shows that in 17 out of 35 OECD countries, young people have less trust in governments than the 50+ generation and 25% of 15-29-year-olds are 'not at all' interested in politics. Paradoxically, they display an unprecedented uptake of digital technologies, including social media, on-line petitions, blogs, to trigger debates on social and political issues and mobilise peers (OECD 2018b). On the government's side, only 40% of OECD countries have multi-year operational youth strategies in place (OECD 2018b). A relevant initiative at the international level is the UN Strategy on Youth, Youth 2030, aims at engaging and empowering youth with a focus on sustainable development, peace and security and human rights. National initiatives seeking to mainstream youth perspectives into policy and decision-making processes include 'youth checks' and youth-sensitive budgeting. Germany and Switzerland have federal strategies to deliver youth policies and services in a consistent fashion. The governance gap between youth engagement and public policy and decision-making processes remains open in most countries. However, there are important initiatives at the sub-national level, such as the Flemish community in Belgium, Quebec province in Canada, and the local level, like the municipality of Gaia in Portugal (OECD 2018b).

In order to advance youth participation, governments should adopt a holistic approach to youth policy, allowing for inter-institutional coordination to open spaces for dialogue and improved delivery of policies and services. Thus, it would be possible to synergise resources among agencies and across the national and sub-national levels. Authorities in charge of creating dialogue spaces should implement effective channels for mainstreaming of youth concerns, including digital technology.

### 4.1.3 Enforcing indigenous peoples' rights and free prior and informed consent

Indigenous rights are an important policy arena to materialise SDG 16 and its targets and GFG 5 (target 5.3 in particular). There is a substantial body of international instruments that protect indigenous peoples' rights, such as the ILO Convention 169 and the United Nations Declaration on the Rights of Indigenous Peoples, with heterogenous levels of enforcement across regions. Among their rights, indigenous communities are entitled to their ancestral territories and should participate in the management and conservation of natural resources.

Latin America is the most advanced region in terms of land tenure reforms and devolution, amounting to about 197 million hectares by 2008, with indigenous population estimated at over 52 million (about 12%) by 2002 (Barry et al. 2010). Devolution processes are also under way in Africa and Asia, in a smaller scale. In the Philippines, communities claiming rights over ancestral territories receive a government-issued Certificate of Ancestral Domain Claim and are responsible for forest management in the terms of the agreement drawn up by the Department of Environment and Natural Resources. The Indigenous Peoples Rights Act grants extensive tenure rights to indigenous communities and accords legitimacy to indigenous customary law for forest-related decision-making (Edmunds and Wollenberg 2003). Indigenous peoples' participation in land demarcation processes is crucial and encompasses tools such as participatory mapping, ethnographic research, surveys, and discussion fora. National governments should lead these processes in close coordination with local authorities, with support from multilateral and bilateral development agencies. Academia and CSOs may prove to be valuable partners, as the Latin American experience has demonstrated.

An important challenge facing national and even local governments is how to harmonise the development of infrastructure (e.g. roads, hydropower plants) and extractive industries (e.g. mining, oil and gas) with respect for ancestral indigenous territories. One fundamental instrument that also furthers indigenous peoples' participation is free prior and informed consent (FPIC). It intends to guarantee that the views of indigenous communities are taken into consideration whenever an action might affect them. Therefore, they should be given the opportunity to voice their perspectives within the decision-making process, *before* any project, plan or action

takes place. National governments should actively enforce FPIC, ensuring that indigenous communities are able to make decisions independently, with no coercion, based on accessible, accurate, timely and sufficient information in a culturally appropriate and accessible fashion (FAO 2016c).

Remarkable progress has been made within the framework of the Convention on Biological Diversity (CBD) in balancing indigenous peoples' rights and interests with conservation. The CBD states in Article 8(j) the obligation of the Parties to respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities and to foster their wider application with their approval and involvement, ensuring equitable benefit sharing derived from traditional knowledge. Consistent with FPIC, the 2000 Akwé: Kon 'Voluntary guidelines for the conduct of cultural, environmental and social assessments regarding developments proposed to take place on, or which are likely to impact on, sacred sites and on lands and waters traditionally occupied or used by indigenous and local communities' seek to safeguard indigenous peoples' and local communities rights and take them into account in new or existing impact-assessment processes and to use appropriate technologies.

The 2010 Tkarihwaié:ri 'Code of Ethical Conduct to Ensure Respect for the Cultural and Intellectual Heritage of Indigenous and Local Communities' guides interactions with indigenous peoples and local communities. It recalls that access to land and water traditionally occupied or used by indigenous peoples and local communities is essential for the retention of traditional knowledge, and the development of innovations and practices relevant for the conservation and sustainable use of biological diversity. Ethical principles comprise respect for existing settlements, intellectual property, non-discrimination, transparency and full disclosure, safeguarding collective or individual ownership, protection, precautionary approach, inter-cultural respect and FPIC or approval and involvement.

Within the Code's provisions, any activity related to traditional knowledge associated with the conservation and sustainable use of biological diversity involving traditional lands, waters or sacred sites requires the FPIC and/or approval and involvement of indigenous and local communities, without any coercion, use of force or manipulation. As for fair and equitable sharing of benefits, the Code determines that indigenous and local

**Box 10. An Asian indigenous peoples' advocacy organization**

It must be noted that indigenous peoples are active advocates of their rights, including self-governance. For example, in 1988 indigenous peoples' movements created the Asia Indigenous Peoples Pact (AIPP) is a regional organization founded in 1988 by indigenous peoples' movements. It currently has 48 members from 14 countries in Asia with 18 indigenous peoples' national alliances/networks and 30 local and sub-national organizations. Interestingly, 16 members are ethnic based organizations, six are indigenous women organizations, four are indigenous youth organizations and one is an organization of indigenous persons with disabilities. The mission of AIPP is to strengthen the solidarity, cooperation and capacities of indigenous peoples in Asia to promote and protect their rights, cultures and identities, and their sustainable resource management systems for their development and self-determination. AIPP has extensive linkages with international entities and processes and is registered as Special Consultative status with the UN Economic and Social Council (ECOSOC), the United Nations Framework Convention on Climate Change (UNFCCC), the Convention on Biological Diversity (CBD), the Global Environment Facility (GEF), the Green Climate Fund (GCF), the United Nations Environment Programme (UNEP), and the World Intellectual Property Organization (WIPO).

Source: Asia Indigenous Peoples Pact (AIPP) 2018.

communities should receive fair and equitable benefits within and among relevant groups, considering relevant community-level procedures, for their contribution to activities and interactions related to biodiversity or that might impact sacred sites and traditional lands and waters.

### 4.1.4 Enhancing public access to information

In order to enable meaningful participation of all concerned stakeholders in decision-making processes, Principle 10 of the 1992 Rio Declaration at the Earth Summit states that at the national level, public authorities shall grant individuals appropriate access to information concerning the environment, including information on hazardous materials and activities in their communities. Furthermore, states must facilitate and encourage public awareness and participation by making information widely available. Also, 'effective access to judicial and administrative proceedings, including redress and remedy, shall be provided.' Information accessibility implies more than physical availability: information should be also culturally accessible. Access to information is also important for citizen awareness and engagement in the policy-making cycle, furthers accountability for results and builds trust in public institutions (OECD n/d b).

This provision is consistent with SDG 16, and is currently subject to international negotiations to enforce it, such as the recently signed Regional Agreement on Access to Information, Public Participation and Justice in Environmental Matters in Latin America and the Caribbean. The objective of this agreement is

> to guarantee the full and effective implementation in Latin America and the Caribbean of the rights of access to environmental information, public participation in the environmental decision-making process and access to justice in environmental matters, and the creation and strengthening of capacities and cooperation, contributing to the protection of the right of every person of present and future generations to live in a healthy environment and to sustainable development.

A global trend that contributes to materialize access to information is 'Open Government Data (OGD)'. It is a conceptual framework that translates into policies that foster institutional transparency and accountability, by making the data available to citizens in accessible formats. The Open Government Partnership[6] (OGP) aims at making governments more inclusive, responsive and accountable by bringing together government agents of change and civil society leaders into a multi-stakeholder collaborative platform. The OGP was created in 2011 by the governments of Brazil, Indonesia, Mexico, Norway, the Philippines, South Africa, the United Kingdom and the United States.

To become a member of OGP, participating countries must endorse a high-level Open Government Declaration, deliver a country action plan developed with public consultation, and commit to independent reporting on their progress going forward. At present, it comprises 79 countries and 20 subnational governments that have made over 3,100 commitments to make their governments more open and accountable.

[6] For more information, visit: https://www.opengovpartnership.org (Accessed: 12/26/2018).

**Box 11. The OECD Open Government Data (OGD) Project**

The OECD Open Government Data project aims to support governments advance international efforts on OGD impact assessment. It will map practices across countries to establish a knowledge base on OGD policies, strategies and initiatives and support the development of a methodology to assess the impact and creation of economic, social and good governance value through OGD initiatives. *Inter alia*, it will answer questions on 'who will pay for the collection and processing of public data if it is made freely available? What are the incentives for government bodies to maintain and update their data? And what data sets should be prioritised for release to maximise public value?' Hence, the project will create a framework for cost and benefit analysis, to collect data, and to prepare case studies demonstrating the concrete benefits (economic, social, and policy) of opening government data.

Source: OECD 2018c.

### 4.2 Improving forest governance, legislation and law enforcement

This section tackles critical issues concerning forest governance and institutions, including law enforcement, consistent with SDGs 10, 16 and 17, as well as GFGs 5 and 6, and target 3.3 of GFG 3. It reviews the main challenges in forest governance, as well as the need to improve the rule of law and environmental justice as basic requirements for peaceful and inclusive societies. Law enforcement for effective forest governance is viewed from a market-based perspective involving demand and supply related instruments such as strong regulations (e.g. EU FLEGT, US Lacey Act, Australian Illegal Logging Prohibition Act), certification (e.g. FSC, PEFC) and the empowerment of forest communities.

#### 4.2.1 Targeting the challenges in forest governance for enhanced rule of law and environmental justice in benefit-sharing

Illegal logging and trade are one of the most pressing challenges in forest governance affecting not only forest ecosystems, but also livelihoods, security and the rule of law. It can be regarded as an effect of poor governance and is often associated to armed conflicts, for the proceedings of illegal timber sales may be used to fund them (Dooley and Ozinga 2011, Noguerón et al. 2018). It involves timber harvesting, transportation, and commercialization in violation of national laws. Illegal activities associated with timber trade include illegal logging, timber smuggling, misclassification, transfer pricing, illegal processing, and corruption (Brack 2005). Global exports of roundwood and sawnwood at high risk of illegality totalled about US$6,330.8 out of a total of US$ 15,076.6 million by 2014 (Gan et al. 2016). It is estimated that crime syndicates annually launder about US$30 to US$100 billion worth of illegal timber while governments are estimated to annually lose approximately US$ 5 billion in revenues (Noguerón et al. 2018). Furthermore, illegal logging causes global timber prices to fall by an average of 7-16% depending on the product (Tacconi 2007b).

Past forest governance initiatives offered mixed results due to challenges related to corruption, deficient regulations and inefficient law enforcement, limited financial incentives for legal forest uses, overregulations, short-term focus on economic growth from a narrow urban perspective and ignorance of customary forest users' potential (Pokorny et al. 2016). The complexity of these issues requires joint efforts by the state and the private sector to advance a holistic and innovative governance approach combining market-driven instruments such as forest certification, eco-labelling and voluntary codes of conduct together with public regulation setting minimum

legality requirements for timber. As it will be discussed in the next, demand-side requirements involve the application of regulatory frameworks and requirements on the legality of timber, while supply-side instruments relate to non-state forest certification regimes. This leads to a new paradigm in global forest trade governance of co-regulation frameworks for value-chain sustainability (Ugarte and Swinkels 2015).

Legislation aimed at combatting illegal logging may affect small-scale and community forestry, as is the case of Western Africa (Tacconi et al. 2016). In Cameroon, besides being expensive, timber exploitation permits were suspended from 1999 to 2006 and harvest volumes have not been adjusted since. In Gabon, discretionary permits are suspended while in Congo, special permits are suspended in parts of the country and no permits are issued in other parts. The artisanal exploitation permits have an incomplete regulation and are suspended in parts of the Democratic Republic of the Congo, and no implementing regulation was issued in the Central African Republic. In Ghana, chainsaw milling is suspended since 1998, and Liberia considers it illegal and suspended it (Tacconi et al. 2016).

Despite normative restrictions, it must be noted that informal or chainsaw logging is widespread in tropical countries and makes up 30% to 40% of the total timber production in Guyana, Republic of Congo, Democratic Republic of the Congo and Uganda; over 50% in Ghana, Cameroon and Perú, and almost 100% in Liberia (Gan et al. 2016). Most of this timber supplies the domestic market. According to recent estimates, domestic consumption accounts for 86% of illegally produced roundwood, 73% of illegally-sourced lumber and 47% of illegally-produced plywood (Gan et al. 2016). Annex 4 presents estimated percentages of illegal timber in high risk producer countries.

### 4.2.2 Promoting market-based interventions

*Demand-side policy measures*

At present, the major world importers of tropical wood are China, India, the EU, USA and Japan, with China and India accounting for 72% of global tropical log imports in 2014 (Gan et al. 2016). Rising concerns about illegal logging and trade and the environmental, social and economic consequences triggered regulatory changes in major timber markets in line with the need of a stronger global forest stewardship. The most important of these are the amendment of the US Lacey Act (2008), Australia's 2012 Illegal Logging Prohibition Act, (AILPA) and the 2013 European Union Timber Regulation (EUTR) (see Annex 1 for a synthesis of their outstanding aspects). These country-level regulations are complemented by bilateral cooperation and free trade agreements addressing illegal logging through legal reform, policy dialogues, technical support, capacity-building and forest governance (Noguerón et al. 2018).

In line with EUTR, the European Union Forest Law Enforcement Law Enforcement, Governance and Trade Action Plan influences the international trade sphere through Voluntary Partnership Agreements (VPAs) with the governments of timber producing countries. FLEGT VPAs require governments to introduce changes in forest governance to ensure the legality of the wood sourced within the country and of imported wood from third countries for reprocessing and export to the European Union. At present, the EU has signed VPAs with Ghana, the Republic of Congo, Cameroon, Indonesia, the Central African Republic and Liberia. Vietnam has concluded negotiations but both parties must complete the procedures for signature and ratification. There are ongoing negotiations with Côte d'Ivoire, Democratic Republic of the Congo, Gabon, Guyana, Honduras, Laos, Malaysia and Thailand. Indonesia is the first country to issue FLEGT Licences.

VPAs may contribute to the improvement of forest governance in developing countries. An interesting feature of FLEGT, consistent with SDG 17, is that the EU and other multilateral organizations like the World Bank provide technical and financial support to aid governments implement the system. Governments of timber-

producer countries should observe equity and inclusive development considerations through social and environmental safeguards, benefit-sharing arrangements and strategic environmental and social impact assessments to avoid negative impacts on the livelihoods of small-holders, indigenous peoples and local communities (Tacconi et al. 2016). In particular, as mentioned in section 4.1.3, governments should enforce legal instruments concerning indigenous peoples' rights, notably FPIC.

*Supply-side policy measures*

The complexity of illegal logging and trade, together with fragile institutions and leakages in public policies of command and control led to deforestation, forest degradation and illegal timber trade in the past. Moreover, weak law enforcement mechanisms have progressively led to the emergence of private governance systems and non-state authorities in global forest governance (Cashore 2002, Gulbrandsen 2004, Pattberg 2005, Humphreys 2006, Klooster 2006, Marx 2013). These environmental policy instruments complement traditional public policy regulations and comprise, *inter alia*, voluntary agreements, certifications (e.g. Forest Stewardship Council – FSC, Programme for the Endorsement of Forest Certification – PEFC), codes of conduct, ecolabelling and other market-driven instruments.

These forest certification schemes intend to sway consumers' preferences into buying certified products. For this to happen, as shown in section 3.7, it is necessary to 'educate' them and raise social awareness on the importance of sustainable forest management from the triple bottom line (environmental, social and economic). Their trajectory has consolidated certification as an institution, with governments of countries such as Brazil and Malaysia promoting it to demonstrate good forest management (Karsenty and Hardin 2017). Central African countries have adopted certification, mainly through FSC, while the Republic of Congo is also adopting the Pan African Forest Certification, a PEFC subsidiary (Karsenty and Hardin 2017). FSC certification in Cameroon contributed to improving weak legal frameworks by decreasing the annual allowable cut by11% on average (Cerutti et al. 2011). It must be noted that within the framework of the EUTR, the US Lacey Act and the Australian Illegal Logging Prohibition Act, voluntary third-party certification cannot guarantee that certified products are legal, although they may be used to demonstrate due diligence (Noguerón et al. 2018).

Governments should provide incentives for the adoption of certifications of sustainable forest management and chain of custody legality. In Navarre, the government partnered with the local small-holders association to provide technical and financial support for group PEFC certification and foster sustainable forest management. Governments should participate in FSC and PEFC national decision-making bodies to ensure that the locally adapted standard is fully consistent with the legal framework and policies.

### 4.2.3 Furthering monitoring and accountability mechanisms

Effective and accountable institutions are essential for inclusive growth, resilient and peaceful societies. Monitoring and accountability mechanisms are essential to ensure effective policy implementation and law enforcement, as well as to allow for evidence-based policy adjustments. Governments should develop effective monitoring and accountability mechanisms including policy research and critical data generation as an input for evidence-based policy making, impact evaluation and adjustment. This information is critical to establish appropriate incentives to sustainable forest management, ensure transparent markets and control timber legality. The adoption of institutional performance measurement through a results-based approach and the implementation of key performance indicators will enhance institutional quality.

The Organisation for Economic Co-operation and Development (OECD) and the World Bank are founding members of the Partnership in Statistics for Development in the 21st Century (PARIS21) which gathers data

producers and users. Their Busan Action Plan for Statistics is a framework to strengthen statistical systems to support national development needs.

Adequate monitoring systems should also provide the basis for consistent cross-sectoral coordination among government departments and agencies. It must be noted that the SDG framework offers opportunities for synergies among SDGs, like SDG 6 'Ensure availability and sustainable management of water and sanitation for all' and SDG 3 'Ensure healthy lives and promote well-being for all at all ages'. However, there are also trade-offs that require deep coordination to avoid unintended negative impacts, as is the case with SDG 2 'End hunger , achieve food security and improved nutrition and promote sustainable agriculture' and SDG 15 'Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss'. Policy coordination would certainly benefit from a nexus approach. Furthermore, consistent with SDG 17 and GFG 6, forest-smart policies should mobilize stakeholders at all levels to identify synergies and innovative solutions to avoid deforestation and forest degradation by integrating forest-based solutions in other sectors (CPF 2018). Civil society has a role as an independent actor to manage tensions and bridge interests between and across sectors at the landscape level.

# 5 Conclusions and recommendations

The Agenda 2030 sets forth a course for a more equitable, peaceful and sustainable world, and challenges governments, business, civil society, academia, forest-dependent communities, small-holders, and society as a whole to embrace a paradigm of development respectful of planetary boundaries, where innovative models such as circular economy and green growth inspires action. From the perspective of this background analytical study, the following policy recommendations summarise its key findings and are fundamental in order to advance SDGs 4, 10 and 16, and GFGs 5 and 6:

## 5.1 Recommendations to enhance forests' contributions to social inclusion and equality

### 1. Small-scale and community forestry foster equitable and inclusive development

Governments should enact a simplified regulatory framework for small-scale and community forestry that incentives local added value and investments in sustainable forest management including simplified management plans and tax regimes, fiscal stability and tax deductions, and infrastructure to facilitate market access. Technical support, capacity building (organizational, technical, financial, commercial) and inclusive finance are key in catalysing local small-holders and community forestry initiatives.

### 2. More effort is needed to advance gender equality and youth engagement

Governments should mainstream gender and youth perspective into policies, support women-led businesses, peer-to-peer mentoring, business incubation, networks and partnerships at the national and regional level, and enable spaces and channels for dialogue including digital technology.

### 3. Secure forest tenure and access rights have a positive impact on local livelihoods and equality and provision of ecosystem services

Governments should promote the cadastral registration of community land tenure arrangements and customary rights and enforce women's forest land tenure and access rights by means of awareness raising, leadership development and operationalisation of constitutional provisions. Resilient provision of ecosystem goods and services could benefit from flexible and agile payment for ecosystem services (PES) systems rewarding

forest stewards' contributions and ensuring their financial sustainability through predictable sources of revenue such as fiscal instruments, blended finance and support to CSO initiatives (e.g. crowdfunding).

### 5.2 Recommendations on forest-based education for sustainable development and sustainable lifestyles

There is a gap between the increasing amount of scientific research and the utilization and adaptation of that research as practical knowledge. It is fair to say that policy, extension, communication, and education are often the missing links between science and practice. Forest education needs institutions and establishment similar to scientific disciplines of forest policy and forestry extension. Forest education should be also viewed as a branch of business in forest sector. General recommendations are the following ten action items:

1. **Initiative (working group) under Collaborative Partnership on Forests.** This working group should cooperate with education organisations such as Global Partnership for Education (GPE) (GFG5 & 6). Major actions to be 1) helping publishing scientific journal "Research on Forests in Education" 2) contributing to organising "International Congress on Forests in Education"
2. **Increase research on forest education**. Power of research to dealing effectively with issues in forestry education. Evidence based education is a must similar to evidence based forest management. Research needs to concern e.g., labour market future research, curriculum content (education aims), education material and pedagogical methods.
3. **Global core curriculum**. Each forest related disciplines should name the fundamental global threshold (minimum level of knowledge/skill) competences for a forestry curriculum. For instance, knowing several hundred both tropical and boreal tree species cannot be in this core. However, the basic processes of Global Climate Change (GCC) is in it. List of competences in Global core curriculum should be under discussion by forestry profession and large audience as well (c.f., curriculum standards in accreditation systems) (GFG3.3)
4. **Strengthen regional and subregional cooperation to meet needs for education, especially teachers' trainings and education networks.** Teachers' competencies in substance pedagogical skills are crucial for successful education. Training for teachers are needed in all educational levels. At the tertiary education the need for pedagogical education is highlighted because it is not often mandatory part of academic career at universities. (GFG3.3) In order to educate broad disciplines and produce expensive online courses education networks among universities are needed.
5. **Learning entrepreneurship in elementary education.** To create models for entrepreneurship education in forestry, agriculture, and agroforestry in local community level. Online material and models are needed. To teach teachers first through online learning and then in local hubs.
6. **Establish MBA type master's degree** for those not having background in forestry. This is more direct and sometimes cost-effective way (also a type of LLL) to increase the forest related competencies among professionals of both forest and non-forest sectors.
7. **Executive education** for political-level decision makers. These kind of informal non-degree courses have been successful in some countries in order to disseminate forest related knowledge and to make networking and societal impact in favour of sustainable forest management. (GFG5 & 6)
8. **Scholarship programme for MSc and Phd students from developing countries**. A forestry and natural resources targeted scholarship programme can be established under UNESCO or World Bank Scholarships Program.
9. **Non-formal and nano learning.** A greater use of mobile apps should be utilized in all levels of education. Many have no access to formal learning and therefore, nano and non-formal education is an option especially in secondary education. A great extent of forestry sector workers have no formal education. It is realism to say that most of them are not available or eligible from several reasons necessarily to formal trainings. Therefore, nano and non formal education is needed for them.

10. **Social learning**. Public awareness of sustainable use of forests and forest products needs innovative informal and social learning applications, such as citizen science and open data applications. Social learning can contribute to all age groups of consumers.

### 5.3 Recommendations to foster effective, accountable and inclusive forest institutions

#### 1. Ensure responsible, inclusive and transparent forest institutions for democratic decision-making

Governments should enable policy dialogue spaces and forest stakeholders' participation in decision-making processes ensuring inclusion of vulnerable groups including women and youth. Decentralisation provides an opportunity to advance democratic involvement of local communities in sustainable forest management. Governments should secure a level playing field and transparency in land planning processes.

#### 2. Address challenges in forest governance and foster timber legality

Governments should adopt robust legal frameworks and provide for their effective enforcement to curb illegal logging and trade. The EU FLEGT initiative provides a strong blueprint that should be advanced by mobilising partnerships for development in the terms of SDG 17. Forest voluntary certification systems, labelling and codes of conduct are valuable measures to enhance sustainable forest management, provided they are combined with consumer awareness.

#### 3. Access to public information improves institutional quality and accountability

Governments should implement Open Government Data policies to advance transparency and accountability, create awareness and enhance social innovation. Moreover, governments should develop effective monitoring and accountability mechanisms including policy research and critical data generation as an input for evidence-based policy making, impact evaluation and adjustment. The adoption of institutional performance measurement through a results-based approach and the implementation of key performance indicators will enhance institutional quality.

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# 7 Annex I - Main provisions of the US Lacey Act, the EU Timber Regulation, and the Australian Illegal Logging Prohibition Act

| | U.S. LACEY ACT | EU TIMBER REGULATION (EUTR) | AUSTRALIAN ILLEGAL LOGGING PROHIBITION ACT (AILPA) |
|---|---|---|---|
| APPLICABILITY AND REQUIREMENTS | It is unlawful for any person to import, export, transport, sell, receive, acquire, or purchase, in interstate or foreign commerce, plants taken, possessed, transported, or sold (1) in violation of any federal U.S. law, treaty, or regulation or of any U.S. Indian tribal law; or (2) in violation of any foreign law or U.S. state law or regulation that protects plants or that regulates the theft of plants; the taking of plants from protected or officially designated areas; the taking of plants contrary to required authorization; the payment of appropriate royalties, taxes, or fees; or the export or transshipment of plants. The law also requires all persons importing plants and certain plant products to declare the scientific name of the plant being imported, the value of the import, the quantity of the plant, and the country of harvest. The declaration does not apply to the recycled content of plant products or to packaging material. The law also prohibits the submission of false records, accounts, labels, and identifications of plants that have been traded in interstate or foreign commerce. The law also requires that all persons trading plants and plant products in interstate or foreign commerce exercise due care to ensure the legality of the products. Due care is the "degree of care which a reasonably prudent person would exercise under the same or similar circumstances. As a result, it is applied differently to different categories of persons with varying degrees of knowledge and responsibility." The Lacey Act Amendment of 2008 went into force in May 2008. However, declaration requirements, which are regulated by the U.S. Animal and Plant Health Inspection Service (APHIS), have been phased in periodically, beginning in May 2009. | Timber placed on the EU market must have been harvested in accordance with applicable legislation in the country of harvest, including legislation and regulations concerning harvesting and related duties, harvest rights and related payments, forest management and biodiversity conservation, trade and customs concerning the forest sector, and third parties' legal rights of use and tenure that are affected by timber harvesting. The regulation applies to certain timber and timber products that are (1) for the first time; (2) physically supplied on the market in the EU, including both imported and domestically produced timber and timber products; (3) for processing or for distribution to commercial or noncommercial consumers, or for use in the business of the operator. All three of these elements must be present simultaneously for the timber or timber product to be considered placed on the market. The regulation entered into force on March 3, 2013. | Under the act, it is a criminal offense to import illegally logged timber and timber products into Australia and to process domestically grown raw logs that have been illegally logged. "Illegally logged" timber is defined as timber harvested in contravention of laws in force in the place—whether or not in Australia—where the timber was harvested. The law applies to timber product importers, whether businesses or individuals, and to persons and Australian-based businesses that process domestically grown logs. The law also requires that a documented due diligence system be established and maintained by importers of regulated timber products and by processors of domestically grown raw logs. Regulations set out key due diligence requirements. The prohibition on importing and processing illegally logged timber went into effect in November 2012. |

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| **PRODUCT SCOPE** | The law covers all trees, both planted and natural, in addition to all other wild plants. The law excludes cultivated plants other than trees, scientific specimens for genetic material, and plants that are to remain planted or be planted or replanted, unless the plant is listed in a Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) appendix, identified as endangered or threatened under the Endangered Species Act of 1973, or listed as an indigenous and threatened species under state conservation laws. The schedule of products requiring import declarations can be found on the U.S. Department of Agriculture (USDA) APHIS website. In January 2018, APHIS proposed to establish new regulations that would exempt from declaration requirements products containing minimal plant material and products containing composite plant materials. If finalized, the new regulations will allow APHIS to introduce additional product categories into the declaration requirement. Any changes to the product scope for required declarations will be announced in the Federal Register | The product scope of EUTR can be amended. As of April 2018, the regulation applies to solid wood products, particle board, fiberboard, plywood, pulp, and paper. The regulation does not apply to printed paper, such as books, magazines, and newspapers. The regulation also does not apply to recycled timber and timber products, or to timber products or components of timber products manufactured from timber products that have completed their lifecycle and would otherwise be disposed of as waste. | The prohibition on importing and processing illegally logged timber applies to all timber and timber products when being imported, and to all domestically grown logs when being processed. The due diligence requirements apply to importers of certain regulated timber products and to processors of domestically grown logs. The applicable regulated timber products are defined by their customs tariff codes. They currently include a wide range of wood and wood fiber–based products, including wood and wooden articles (Chapter 44), pulp (Chapter 47), paper (Chapter 48), and furniture (Chapter 94). There are two exemptions to the due diligence requirements:<br>■■ Regulated timber products made from 95% postconsumer recycled material<br>■■ Any consignment where the total value of the regulated timber products does not exceed AUS$1,000. In addition, due diligence requirements do not apply to packaging material used to support, protect, or carry regulated timber products. |
| **COMPLIANCE** | The statute is fact-based and not processor document-based, meaning the law does not specify what documentation must be collected or maintained or what actions must be taken to demonstrate due care. Rather, the law specifies what is prohibited from interstate and foreign commerce and the penalties for misdeclarations, mislabeling, failure to exercise due care, and knowingly violating the Lacey Act. The federal government, however, has outlined Lacey Act compliance programs in two separate, high-profile Lacey Act enforcement actions that resulted in both Gibson Guitar, an instrument manufacturer, and Lumber Liquidators, a wood flooring retailer, reaching agreements with the U.S. Department of Justice. Though distinct, these compliance programs both included requirements for annual compliance trainings, risk assessments, and supply chain audits, along with other expanded due care practices. | EUTR requires operators to exercise due diligence when placing timber or timber products on the market for the first time and requires that operators maintain and regularly evaluate their due diligence system, except when operators use a due diligence system established by a recognized monitoring organization. (See Appendix F for examples of recognized monitoring organizations.) Due diligence systems must include measures and procedures that provide access to information on the trader's suppliers, product trade name and scientific name, country of harvest, quantity, and documents required under applicable legislation. The due diligence system must also include risk assessment and risk mitigation procedures. Traders throughout the supply chain are required to maintain information for 5 years on the identities of their suppliers and the traders to whom they have supplied. Timber and timber products covered by valid Forest Law Enforcement, Governance and Trade (FLEGT), and CITES permits and licenses are considered to comply with the | All importers and processors must have a due diligence system, a copy of which must be provided to the Department of Agriculture and Water Resources upon request as part of a compliance assessment. There is no standard or government approved due diligence system. Rather, regulations set out key steps that must be included within due diligence systems:<br>■■ Step 1: Establishing and maintaining a due diligence system, describing the procedures used to minimize the risk that the timber in question is illegal.<br>■■ Step 2: Gathering information about the timber or timber product being imported or processed.<br>■■ Step 3: Undertaking a risk assessment, including, where appropriate, the use of a Timber Legality Framework, country- or state specific guideline, and/or regulated risk factors. The identification, assessment, and outcomes of the identification and assessment of the risk must be "reasonable."<br>■■ Step 4: Mitigating the risk that the product includes illegally logged timber; |

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| | | regulation. See Box 3 for more information on the implementation of EUTR. | if the risk cannot be adequately mitigated, the product should not be imported or processed.<br>■■ Step 5: Maintaining records covering all steps that have been undertaken as part of the due diligence process. See Box 3 for more information on the implementation of AILPA. |
| **PENALTIES** | Violations of the law can result in civil and/or criminal penalties and forfeitures. Penalties are assessed per violation and vary depending on the level of due care exercised or actual knowledge of the illegality of trading in the plant. Civil penalties up to $10,000 may be imposed for failure to exercise due care, and civil penalties up to $250 may be imposed for violating declaration requirements. Misdemeanor and felony criminal penalties may be imposed, with a maximum felony criminal penalty of up to $250,000 for individuals and $500,000 for corporations and/or imprisonment up to 5 years for defendants who knew or were generally aware of the illegal nature of the plant. Persons or corporations who trade in illegal products while failing to exercise due care may be prosecuted for a misdemeanor criminal violation, with penalties of up to one year in prison and fines of up to $200,000 for corporations. Persons or corporations trading in illegal plants are subject to forfeiture on a strict liability basis, meaning that the government need not show the defendant's knowledge of illegality or failure to exercise due care. In 2016, the U.S. Department of Justice prosecuted Lumber Liquidators for criminal violations of the Lacey Act and U.S. customs law—the first case involving a felony conviction for trade in timber. Lumber Liquidators agreed to pay over $13 million in fines, forfeiture of goods, and community service. Lumber Liquidators also agreed to a 5-year term of probation and mandatory implementation of the above-mentioned rigorous and public government–approved environmental compliance plan. | Member states define the penalties and are responsible for implementing them, including the designation of competent authorities to enforce the regulation. Penalties, required by the EUTR to be effective, proportionate, and dissuasive, may include, but are not limited to, fines, seizure of the concerned timber and timber products, and immediate suspension of trade authorization. Implementation of the EUTR has included authorities carrying out site visits of companies, as well as reviews of companies' due diligence systems. Enforcement actions have included the issuance of Corrective Action Requirements, warning letters, injunctions, and fines. Some of the most high-profile enforcement actions have been in Sweden and Denmark, whose enforcement authorities leveled injunctions against companies importing teak from Myanmar, since documentation provided by the Myanmar government was found to provide information insufficient for meeting EUTR requirements. | Penalties depend on the offense committed and are ultimately at the discretion of a court. Although implementation of the act began with a "soft start" compliance period, during which the Department of Agriculture and Water Resources did not issue due diligence noncompliance penalties, the "soft start" compliance period ended on December 31, 2017. As of January 1, 2018, businesses and individuals who fail to comply with due diligence requirements may be subject to penalties. Knowingly processing an illegally logged raw log or importing illegally logged timber or regulated timber products is a criminal offense and carries a maximum penalty of 5 years imprisonment and/ or fine of up to 500 penalty units (AUS$105,000 for an individual or AUS$525,000 for a business.) A breach of the due diligence requirements may result in civil penalties with a maximum of 300 penalty units (AUS$63,000 for an individual or AUS$315,000 for a business). |

Source: Noguerón et al. (2018).

# 8 *Annex 2. List of existing forest-related free learning materials and course*

| Topic of the resource | Site address |
|---|---|
| Tree Functional Attributes and Ecological Database | http://www.worldagroforestry.org/output?field_type_tid=75 |
| Climate change education materials for teachers (TROP-ICSU) | https://tropicsu.org/ |
| The LEAF Programme | http://www.leaf.global/ |
| Videos on economics of conservation | https://www.conservation-strategy.org/en/page/about-conservation-strategy-fundv |
| Community Powerdown Toolkit | www.cultivate.ie |
| The Centre for Environmental Living and Training (CELT) | www.celtnet.org |
| Ecosaver programme | www.globalactionplan.ie |
| Energy Awareness Programme | www.tea.ie |
| WikiFoundatino platform for leaning | https://en.wikiversity.org/wiki/Wikiversity:Main_Page |
| Eurydice. European systems of education | https://eacea.ec.europa.eu/national-policies/eurydice/home_en |

# 9 Annex 3 – Sustainable Development Goals 4, 10, 16 and 17 and Global Forest Goals

**SDG4 Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all**

**Targets**

1. By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and Goal-4 effective learning outcomes
2. By 2030, ensure that all girls and boys have access to quality early childhood development, care and preprimary education so that they are ready for primary education
3. By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university
4. By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship
5. By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations
6. By 2030, ensure that all youth and a substantial proportion of adults, both men and women, achieve literacy and numeracy
7. 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
8. Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, nonviolent, inclusive and effective learning environments for all
9. By 2020, substantially expand globally the number of scholarships available to developing countries, in particular least developed countries, small island developing States and African countries, for enrolment in higher education, including vocational training and information and communications technology, technical, engineering and scientific programmes, in developed countries and other developing countries
10. By 2030, substantially increase the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially least developed countries and small island developing states

**SDG 10 Reduce inequality within and among countries**

**Targets**

10.1 By 2030, progressively achieve and sustain income growth of the bottom 40 per cent of the population at a rate higher than the national average

10.2 By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status

10.3 Ensure equal opportunity and reduce inequalities of outcome, including by eliminating discriminatory laws, policies and practices and promoting appropriate legislation, policies and action in this regard

10.4 Adopt policies, especially fiscal, wage and social protection policies, and progressively achieve greater equality

10.5 Improve the regulation and monitoring of global financial markets and institutions and strengthen the implementation of such regulations

10.6 Ensure enhanced representation and voice for developing countries in decision-making in global international economic and financial institutions in order to deliver more effective, credible, accountable and legitimate institutions

10.7 Facilitate orderly, safe, regular and responsible migration and mobility of people, including through the implementation of planned and well-managed migration policies

10.a Implement the principle of special and differential treatment for developing countries, in particular least developed countries, in accordance with World Trade Organization agreements

10.b Encourage official development assistance and financial flows, including foreign direct investment, to States where the need is greatest, in particular least developed countries, African countries, small island developing States and landlocked developing countries, in accordance with their national plans and programmes

10.c By 2030, reduce to less than 3 per cent the transaction costs of migrant remittances and eliminate remittance corridors with costs higher than 5 per cent

**SDG 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels**

**Targets**

16.1 Significantly reduce all forms of violence and related death rates everywhere

16.2 End abuse, exploitation, trafficking and all forms of violence against and torture of children

16.3 Promote the rule of law at the national and international levels and ensure equal access to justice for all

16.4 By 2030, significantly reduce illicit financial and arms flows, strengthen the recovery and return of stolen assets and combat all forms of organized crime

16.5 Substantially reduce corruption and bribery in all their forms

16.6 Develop effective, accountable and transparent institutions at all levels

16.7 Ensure responsive, inclusive, participatory and representative decisionmaking at all levels

16.8 Broaden and strengthen the participation of developing countries in the institutions of global governance

16.9 By 2030, provide legal identity for all, including birth registration

16.10 Ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements

16.a Strengthen relevant national institutions, including through international cooperation, for building capacity at all levels, in particular in developing countries, to prevent violence and combat terrorism and crime

16.b Promote and enforce non-discriminatory laws and policies for sustainable development

**SDG 17. Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development**

**Targets**

**Finance**

17.1 Strengthen domestic resource mobilization, including through international support to developing countries, to improve domestic capacity for tax and other revenue collection

17.2 Developed countries to implement fully their official development assistance commitments, including the commitment by many developed countries to achieve the target of 0.7 per cent of gross national income for official development assistance (ODA/GNI) to developing countries and 0.15 to 0.20 per cent of ODA/GNI to least developed countries; ODA providers are encouraged to consider setting a target to provide at least 0.20 per cent of ODA/GNI to least developed countries

17.3 Mobilize additional financial resources for developing countries from multiple sources

17.4 Assist developing countries in attaining long-term debt sustainability through coordinated policies aimed at fostering debt financing, debt relief and debt restructuring, as appropriate, and address the external debt of highly indebted poor countries to reduce debt distress

17.5 Adopt and implement investment promotion regimes for least developed countries

**Technology**

17.6 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 United Nations level, and through a global technology facilitation mechanism

17.7 Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favourable terms, including on concessional and preferential terms, as mutually agreed

17.8 Fully operationalize the technology bank and science, technology and innovation capacity-building mechanism for least developed countries by 2017 and enhance the use of enabling technology, in particular information and communications technology

**Capacity-building**

17.9 Enhance international support for implementing effective and targeted capacity-building in developing countries to support national plans to implement all the Sustainable Development Goals, including through North-South, South-South and triangular cooperation

**Trade**

17.10 Promote a universal, rules-based, open, non-discriminatory and equitable multilateral trading system under the World Trade Organization, including through the conclusion of negotiations under its Doha Development Agenda

17.11 Significantly increase the exports of developing countries, in particular with a view to doubling the least developed countries' share of global exports by 2020

17.12 Realize timely implementation of duty-free and quota-free market access on a lasting basis for all least developed countries, consistent with World Trade Organization decisions, including by ensuring that preferential rules of origin applicable to imports from least developed countries are transparent and simple, and contribute to facilitating market access

**Systemic issues**

*Policy and institutional coherence*

17.13 Enhance global macroeconomic stability, including through policy coordination and policy coherence

17.14 Enhance policy coherence for sustainable development

17.15 Respect each country's policy space and leadership to establish and implement policies for poverty eradication and sustainable development

*Multi-stakeholder partnerships*

17.16 Enhance the Global Partnership for Sustainable Development, complemented by multi-stakeholder 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

17.17 Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships

*Data, monitoring and accountability*

17.18 By 2020, enhance capacity-building support to developing countries, including for least developed countries and small island developing States, to increase significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics relevant in national contexts

17.19 By 2030, build on existing initiatives to develop measurements of progress on sustainable development that complement gross domestic product, and support statistical capacity-building in developing countries

**UN Global Forest goals**

**Global forest goal 1**

Reverse the loss of forest cover worldwide through sustainable forest management, including protection, restoration, afforestation and reforestation, and increase efforts to prevent forest degradation and contribute to the global effort of addressing climate change

1.1 Forest area is increased by 3 per cent worldwide

1.2 The world's forest carbon stocks are maintained or enhanced

1.3 By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally

1.4 The resilience and adaptive capacity of all types of forests to natural disasters and the impact of climate change is significantly strengthened worldwide

**Global forest goal 2**

Enhance forest-based economic, social and environmental benefits, including by improving the livelihoods of forest-dependent people

2.1 Extreme poverty for all forest-dependent people is eradicated

2.2 Increase the access of small-scale forest enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets

2.3 The contribution of forests and trees to food security is significantly increased

2.4 The contribution of forest industry, other forest-based enterprises and forest ecosystem services to social, economic and environmental development, among other things, is significantly increased

2.5 The contribution of all types of forests to biodiversity conservation and climate change mitigation and adaptation is enhanced, taking into account the mandates and ongoing work of relevant conventions and instruments

**Global forest goal 3**

Increase significantly the area of protected forests worldwide and other areas of sustainably managed forests, as well as the proportion of forest products from sustainably managed forests

3.1 The area of forests worldwide designated as protected areas or conserved through other effective area-based conservation measures is significantly increased

3.2 The area of forests under long-term forest management plans is significantly increased

3.3 The proportion of forest products from sustainably managed forests is significantly increased

**Global forest goal 4**

Mobilize significantly increased, new and additional financial resources from all sources for the implementation of sustainable forest management and strengthen scientific and technical cooperation and partnerships

4.1 Mobilize significant resources from all sources and at all levels to finance sustainable forest management and provide adequate incentives to developing countries to advance such management, including for

conservation and reforestation

4.2 Forest-related financing from all sources at all levels, including public (national, bilateral, multilateral and triangular), private and philanthropic financing, is significantly increased

4.3 North-South, South-South, North-North and triangular cooperation and public-private partnerships on science, technology and innovation in the forest sector are significantly enhanced and increased

4.4 The number of countries that have developed and implemented forest financing strategies and have access to financing from all sources is significantly increased

4.5 The collection, availability and accessibility of forest-related information is improved through, for example, multidisciplinary scientific assessments

**Global forest goal 5**

Promote governance frameworks to implement sustainable forest management, including through the United Nations forest instrument, and enhance the contribution of forests to the 2030 Agenda for Sustainable Development

5.1 The number of countries that have integrated forests into their national sustainable development plans and/or poverty reduction strategies is significantly increased

5.2 Forest law enforcement and governance are enhanced, including through significantly strengthening national and subnational forest authorities, and illegal logging and associated trade are significantly reduced worldwide

5.3 National and subnational forest-related policies and programmes are coherent, coordinated and complementary across ministries, departments and authorities, consistent with national laws, and engage relevant stakeholders, local communities and indigenous peoples, fully recognizing the United Nations Declaration on the Rights of Indigenous Peoples

5.4 Forest-related issues and the forest sector are fully integrated into decision-making processes concerning land use planning and development

**Global forest goal 6**

Enhance cooperation, coordination, coherence and synergies on forest-related issues at all levels, including within the United Nations system and across member organizations of the Collaborative Partnership on Forests, as well as across sectors and relevant stakeholders

6.1 Forest-related programmes within the United Nations system are coherent and complementary and integrate the global forest goals and

targets, where appropriate

6.2 Forest-related programmes across member organizations of the Collaborative Partnership on Forests are coherent and complementary and together encompass the multiple contributions of forests and the forest sector to the 2030 Agenda for Sustainable Development

6.3 Cross-sectoral coordination and cooperation to promote sustainable forest management and halt deforestation and forest degradation are significantly enhanced at all levels

6.4 A greater common understanding of the concept of sustainable forest management is achieved and an associated set of indicators is identified

6.5 The input and involvement of major groups and other relevant stakeholders in the implementation of the strategic plan and in the work of the Forum, including intersessional work, is strengthened

## 10 Annex 4- Estimated percentages of illegal logging

The following table shows some recent estimates of the percentage of timber informally or illegally logged in the main producer tropical countries.

| Country | Source of estimate | | | |
|---|---|---|---|---|
| | Seneca Creek Associates and Wood Res. Ind. (2004) (1) | World Bank (2006) (2) | Hoare (2015) (3) | Nellemann and INTERPOL (2012) (4) |
| **Bolivia** | 80 | 80 | | |
| **Brazil (Amazon)** | 20-47 | 20-47 | >50 | |
| **Cambodia** | 90 | 90 | | |
| **Cameroon** | 50 | 50 | 65 | |
| **Colombia** | 42 | 42 | | |
| **Democratic Republic of Congo** | | | >90 | |
| **Ecuador** | 70 | 70 | | |
| **Gabon** | 50-70 | 70 | | |
| **Ghana** | 35-60 | | 70 | |
| **Indonesia** | 70-80 | 70-80 | 60 | |
| **Laos** | 45 | 45 | 80 | |
| **Liberia** | 80 | | | |
| **Malaysia** | 35 | 35 | 35 | |
| **Myanmar** | 50 | 50 | | |
| **Papua New Guinea** | 70 | 70 | 70 | |
| **Peru** | 80-90 | 80 | | |
| **Republic of Congo** | | | 70 | |
| **Russia** | 20-50 | 10-50 | | |
| **Thailand** | 40 | 40 | | |
| **Vietnam** | 20-40 | 20-40 | | |
| **World** | | | | 15-30 |

Source: Tacconi et al. 2016. (1) Seneca Creek Associates and Wood Resources International. 2004. *'Illegal' Logging and Global Wood Markets: The Competitive Impacts on the US Wood Product Industry*. Prepared for American Forest & Paper Association. (2) World Bank. 2006. *Stregthening Forest Law Enforcement and Governance: Assessing a Systematic Constraint to Sustainable Development*. Washington, D.C.: World Bank. (3) Hoare, A. 2015. *Tackling Illegal Logging and the Related Trade: What Progress and What Next?* London: Chatham House. (4) Nellemann and INTERPOL Environmental Crime Program (eds.). 2012. *Green Carbon, Black Trade: Illegal Logging, Tax Fraud and Laundering in the Worlds Tropical Forests. A Rapid Response Assessment*. Arendal: UNEP, GRID-Arendal.

[i] Independent Researcher, School of Politics and Government, National University of San Martin, Argentina
[ii] Lecturer, Department of Forest Sciences, University of Helsinki, Finland