

Report of the Inter-agency
Task Force on Financing
for Development

FINANCING FOR DEVELOPMENT: PROGRESS AND PROSPECTS 2018



United Nations

This report is a joint product of the members of the Inter-agency Task Force on Financing for Development (members are shown on page xi). The Financing for Development Office of the United Nations Department of Economic and Social Affairs serves as the coordinator and substantive editor of the Task Force report.

The online annex of the Task Force (<http://developmentfinance.un.org>) comprehensively monitors progress in implementation of the Financing for Development outcomes, including the Addis Ababa Action Agenda and relevant means of implementation targets of the SDGs. It provides the complete evidence base for the Task Force's annual report on progress in the seven action areas of the Addis Ababa Agenda (chapters III.A–III.G). The report is by necessity more concise and selective, and should thus be read in conjunction with the online annex.

The online annex of the Task Force also covers several key cross-cutting initiatives that build on the synergies of the Sustainable Development Goals in-depth:

- Delivering social protection and essential public services
- Ending hunger and malnutrition
- Closing the infrastructure gap
- Promoting inclusive and sustainable industrialization
- Generating full and productive employment for all
- Protecting ecosystems
- Promoting peaceful and inclusive societies
- Gender equality
- Investing in children and youth
- Addressing the diverse needs and challenges faced by countries in special situations
- Global partnership

Inquiries about the Task Force or its report and online annex can be sent to:

Financing for Development Office
Department of Economic and Social Affairs
2 United Nations Plaza (DC2- 2170)
New York, N.Y. 10017
United States of America
+1-212-963-4598

developmentfinance@un.org

<http://developmentfinance.un.org>

United Nations publication
Sales no. E.18.I.5
ISBN 978-92-1-101386-3

Copyright © United Nations, 2018
All rights reserved

Chapter II

Financing investment in selected SDGs

1. Overview

The Addis Ababa Action Agenda (hereafter, Addis Agenda) calls for increased investment in sustainable and resilient infrastructure, including the areas of energy, water and sanitation for all, as prerequisites for achieving the Sustainable Development Goals (SDGs). Closing the global infrastructure gap has become a major priority for the international community. Several new initiatives have been launched, including the Global Infrastructure Forum called for in the Addis Agenda, other infrastructure platforms and facilities, and new development banks and finance institutions. Yet, major challenges remain to scale up SDG investments in infrastructure and beyond. To support countries in this effort, this chapter examines the SDG financing challenges under in-depth review at the 2018 United Nations High-level Political Forum on Sustainable Development, namely SDGs 6 (clean water and sanitation), 7 (affordable and clean energy), 11 (sustainable cities and communities), 12 (responsible consumption and production) and 15 (life on land).¹

While the financing models for each of these SDGs draws on all seven chapters of the Addis Agenda, a key question underlying many of the international debates is what roles public, private and blended financing should play. The Addis Agenda stresses that all sources of financing are needed and that they are complementary, with different objectives and characteristics making them more or less suitable in different contexts and sectors. The Addis Agenda also underlines the potential of blended

finance instruments, while calling for careful consideration of their appropriate structure and use.

Because the sectors covered in this chapter in large part address public services and goods, national and subnational public authorities are ultimately responsible for service delivery. Public policies and actions must thus be the driving force. An examination of the SDG sectors under review highlighted several policy priorities.² These include:

- ***Enhancing institutional and regulatory frameworks*** Strong institutions and the rule of law are the starting point for effective economic governance. They need to be coupled with transparent, consistent and quality regulatory frameworks to guide private operators in each sector, manage natural monopolies, encourage innovation, limit red tape, and promote universal access to infrastructure services. Without this enabling environment, investment risks will remain particularly high, and neither public nor private financing or operation is likely to satisfy public need in a cost-efficient manner. A stable international macroeconomic environment is also required to support sustainable long-term investments in the targeted sectors (see chapter III.F);
- ***Developing infrastructure plans*** Plans should integrate financing frameworks and align with country development strategies.³ They should provide a long-term vision (beyond the political cycle), include adequate

¹ Responsible consumption and production is treated as a cross-cutting issue throughout the different sections of this chapter, where applicable.

² On this topic, see also *World Investment Report 2014. Investing in the SDGs: An Action Plan* (United Nations publication, Sales No. E.14.II.D.1). Available from http://unctad.org/en/PublicationsLibrary/wir2014_en.pdf.

³ According to the Global Infrastructure Hub's *Infra Compass*, only 25 out of a sample of 48 countries have a national or subnational infrastructure plan (data accessed on 13 February 2018).

stakeholder consultations, and incorporate climate impact and resilience as well as gender assessments. They should also serve to coordinate across sectors, given synergies and interconnections (e.g., hydropower plants impact energy, water and ecosystems);

- **Translating plans into quality project pipelines** This calls for sufficient human and financial resources, adequately prepared projects, and effective procurement and frameworks for public-private partnerships (PPP), as applicable. In this context, Governments can benefit from multilateral development bank platforms that support the development of replicable and scalable infrastructure projects, such as SOURCE and the Global Infrastructure Facility (GIF);⁴
- **Strengthening public finance** Equity, social inclusion and other public good considerations provide a rationale for public engagement through direct financing, subsidies, guarantees, or other incentives and/or regulation. However, in many countries, public balance sheets and fiscal space are constrained, and debt sustainability is a major concern. This underscores the need for boosting public financial resources, both domestically (largely through improved taxation) and internationally (through official development assistance (ODA)). South-South cooperation and other official development finance can play complementary roles (see chapter III.A, III.C, and III.E);
- **Mobilizing the private sector** The private sector may be involved in the ownership, operation and finance of projects, depending on country and sector priorities (with most deals focused on finance or operation, and not on privatization per se). While the private sector can bring cost-efficient solutions, it is also often associated with higher financing costs because most investors demand a competitive return for the risk they assume.

To effectively contribute to many SDGs, private financing flows need to be stable and long-term oriented (see chapter III.B);

- **Getting prices right** Where socially feasible, price signals can address externalities (“polluter pays principle”) and support sustainable consumption and production patterns—for example, through carbon pricing or phasing out harmful subsidies, taking fully into account the specific needs and conditions of developing countries and minimizing possible adverse impacts on their development in a manner that protects the poor and the affected communities, as called for in the Addis Agenda;
- **Strengthening international cooperation** Developing countries need significant capacity-building support to make progress in these areas and create institutions capable of delivering the ambitious SDG agenda (see chapter III.C).

These policy priorities can guide stakeholders as they scale up SDG financing. Previous Inter-agency Task Force reports have also highlighted several factors to consider in determining combinations of private and public ownership, operation and financing of projects, including (i) whether investments can be sufficiently profitable to compensate private investors for the risks they bear; (ii) whether investments produce goods or services that can be effectively supplied by the market, or whether they have public-good properties (including positive or negative externalities) that require public involvement; (iii) whether public intervention is warranted for social equity reasons; and (iv) whether private investors can bring efficiency gains through the profit incentive.

For example, investments in ecosystems will largely be publicly financed owing to the public-good nature of the sector, although private initiatives sometimes play a role, often through philanthropy or impact investing⁵ (see chapter III.B). Private

⁴ SOURCE is a joint initiative of multilateral development banks to develop sustainable, bankable and investment-ready infrastructure projects (<https://public.sif-source.org/>). The Global Infrastructure Facility (GIF) supports Governments in bringing well-structured and bankable infrastructure projects to market (<http://www.globalinfrafacility.org/>).

⁵ That is, private investors who seek to have a positive social or environmental impact alongside their profit.

financing is most likely to be appropriate in sectors where projects can generate sufficient returns, such as in the energy sector, although with public oversight and often public support. The use of private finance is more challenging in areas where equity considerations and large financing gaps reduce profit prospects—such as water, where various financing models have been utilized (see figure 1, which provides a rough breakdown of the roles of public and private financing across sectors, each of which depends on an overall enabling environment).

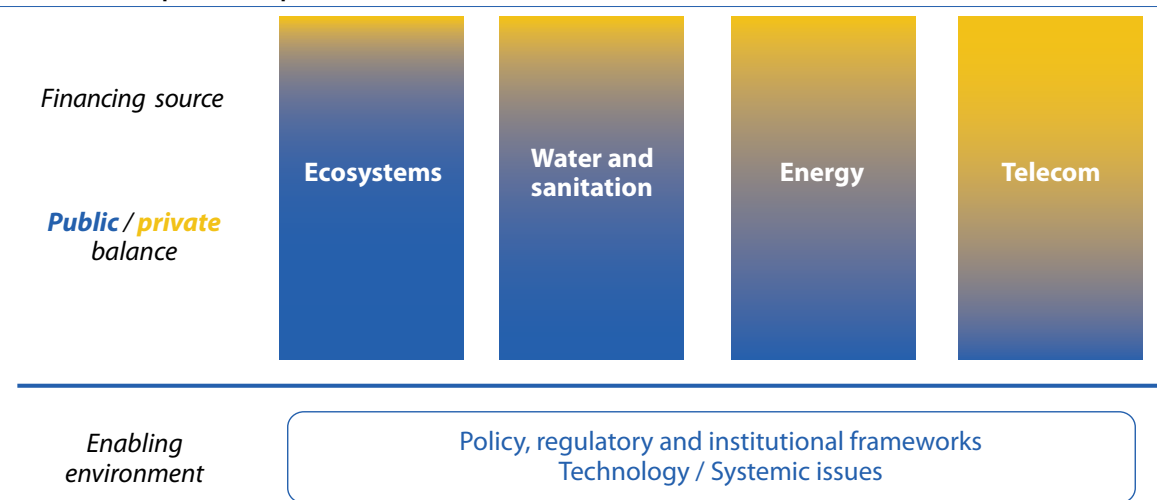
As noted above, the domestic and international enabling environments are critical factors for investment. When the perceived risk of project failure is high, the cost of private finance, in particular, is likely to be prohibitive. Financing strategies need to consider how to avoid locking in high financial costs that reflect domestic risks for the entire duration of infrastructure projects (often 20 years or more). This is particularly relevant for countries that are in the process of strengthening institutions and thus reducing risks. Development banks could assist countries in building such financing strategies. This also underscores the importance of public finance, either through direct financing or blending strategies (see chapter III.C). However, blended strategies can also create contingent liabilities that need to be carefully managed (see chapter III.E).

The scale of financing in these sectors requires mobilizing both domestic and international sources. International financing is often a critical complement to domestic resources, but might generate currency risks that are difficult to manage at a country level. This calls for examining whether global approaches allowing the diversification of currency risks could be developed, by development banks, for instance.

To examine how public and private firms can contribute in the sectors under review, it is also important to better understand the sources of cash flows that maintain operations and cover financing costs. They can come from three main sources: (i) users (tariffs), (ii) public authorities (taxes) and transfers from national to subnational governments or (iii) external partners (see table 1). These sources of cash flow provide the basis to mobilize repayable finance, including concessional and non-concessional finance, necessary for realizing the required investments in these sectors. Table 1 lists examples of these different financing sources across the SDG sectors under review.

These initial considerations provide a general framework for understanding the capital structure of some SDG investments. However, further analysis of sector specificities is needed to better understand possible financing options and the practical reality of each sector.

Figure 1
Continuum of public and private finance



Source: UN/DESA.

Table 1
Examples of cash flow sources per sector

Type of cash flow	Examples of cash flows in highlighted sectors			
	Subnational finance	Water and sanitation	Energy	Terrestrial ecosystem
Tariffs / user fees / user investment	<ul style="list-style-type: none"> • Fees (e.g., for public transport / trash collection / parking) 	<ul style="list-style-type: none"> • User investment (e.g., toilets or boreholes) • Fees to water utilities 	<ul style="list-style-type: none"> • User investment (e.g., clean cooking fuels / solar panels) • Fees to energy utilities/ energy service companies • Savings on energy bills (energy efficiency) 	<ul style="list-style-type: none"> • Payment for ecosystems services • Green commodities • Biodiversity offsets
Taxes / public subsidies/ domestic transfers	<ul style="list-style-type: none"> • Local taxes (e.g., property taxes) • Transfers from central Governments 	<ul style="list-style-type: none"> • Transfers from central Governments • Targeted subsidies 	<ul style="list-style-type: none"> • Public subsidies (e.g., feed-in tariff premium) • Tax breaks for energy efficiency • Carbon credits 	<ul style="list-style-type: none"> • Budget allocation • Agricultural subsidies with biodiversity goals
Grants (donor assistance / philanthropy)	<ul style="list-style-type: none"> • External grants (e.g., to public transport systems) 	<ul style="list-style-type: none"> • Viability gap funding in water projects 	<ul style="list-style-type: none"> • Technical assistance for energy audits 	<ul style="list-style-type: none"> • Grants channelled through NGOs • REDD +

Source: UN/DESA.

2. Subnational finance

SDG 11 aims to make cities inclusive, safe, resilient and sustainable in a context of unprecedented urban growth. In 2015, close to 4 billion people—54 per cent of the world's population—lived in cities, and that number is projected to increase to about 5 billion people by 2030.⁶ In the least developed countries (LDCs), the proportion of urban population is expected to increase from 31 per cent in 2014 to 49 per cent in 2050.⁷ Such rapid growth demands significant investments at the subnational level, including in housing, public transport, water, and waste management. In some countries, subnational governments (SNGs) already contribute significantly to financing and delivering infrastructure, accounting for nearly 40 per cent of public investment.⁸ It is

estimated that more than 70 per cent of infrastructure will be built in urban areas, and that by 2030 these investments could be greater than the \$50 trillion value of all the infrastructure in the world today.⁹ However, subnational governments, especially second-tier cities, face considerable challenges in mobilizing adequate revenue to meet recurrent expenditures and make long-term investments in support of inclusive and sustainable local development. LDCs face the steepest challenges. Addressing these challenges requires a better understanding of the financing options available to SNGs.

2.1 Characteristics of subnational finance

SNGs have to finance their operational expenditures as well as a range of investments. Their financing sources include local taxes and user fees;¹⁰ trans-

6 Report of the Secretary-General on progress towards the Sustainable Development Goals (E/2017/66). Available from http://www.un.org/ga/search/view_doc.asp?symbol=E/2017/66&Lang=E.

7 Daniel Platz and others, "Financing sustainable urban development in the least developed countries" (New York, United Nations Financing for Development Office of the Department of Economic and Social Affairs and the United Nations Capital Development Fund, 2017). Available from <http://www.un.org/esa/ffd/wp-content/uploads/2016/09/Financing-Sustainable-Urban-Development-in-LDCs.pdf>.

8 Based on a sample of 90 countries in 2013. Organization for Economic Cooperation and Development (OECD) and United Cities and Local Governments (UCLG), *Subnational governments around the world: structure and finance* (Paris and Barcelona, 2016).

9 Cities Climate Finance Leadership Alliance, "State of city climate finance 2015" (New York, 2015).

10 User fees include parking fees, business licences, trash collection fees, or other charges (fees imposed on market vendors for using public space, charges from taxi stalls or bus terminals). These fees often make up the bulk of own-source revenues in poorer developing countries that have very limited taxing authority.

ferred national or state revenues; and borrowing from public and private lenders. Transfers from a higher level of government are typically the most significant source in this category, underscoring the importance of effective national/subnational interfaces.

The projects needing finance have varying cash flow profiles, which influences the kind of financing they can use. While revenue-generating investments (e.g., public transport systems) are more suitable for borrowing, social investments, like school buildings, are more likely to be financed through transfers or tax financing. Subnational governments' creditworthiness also affects the types of instruments available, with stronger entities being capable of accessing capital markets. Table 2 provides a framework to assess the range of finance options available to SNGs.

2.2 Action areas

Action areas for subnational financing include raising domestic revenues through user fees and taxes—including defining the most appropriate types of taxation for SNGs—and fostering sustainable access to long-term finance.

Reforms and actions will, however, depend on specific country conditions such as the existing experience of a country with decentralization, the legal systems in place, and the levels of institutional development and capacity.

2.2.1 Promoting revenue raising authorities

In many countries, SNGs have limited fiscal authority and capacity to raise their own revenues. Intergovernmental transfers are dominant because national Governments have an inherent advantage

in revenue generation. Nonetheless, SNGs are often in a better position to plan and manage a range of local public services in a more holistic manner, since local governments are more likely to think about the linkages between service sectors than national Governments, where sectoral ministries tend to focus on the services with which they are directly concerned. The ability of SNGs to raise resources depends on the extent to which they have adequate fiscal powers and the capacity and incentives to use them. This requires both a clear *de jure* legal framework as well as *de facto* autonomy and independence at appropriate levels. One lesson from experiences with subnational taxation is that it is important not to let sources of revenue or some types of taxes create disproportionate administrative costs compared to the collected revenues.

Empowering subnational authorities

As noted above, two common revenue sources for subnational governments are user fees and local taxes. User fees help to establish accountability for service delivery, although they can also render some services too expensive for the poor. Regarding taxes, surcharges and property taxes are particularly useful on the subnational level.

Surcharges (known as piggyback taxes) allow SNGs to add a usually small but sometimes significant percentage onto the same tax base and through the same collection system as taxes at the national level (e.g., sales and income taxes), thus exploiting more efficient centralized revenue administration. As such, they are easier to implement than other forms of taxation.

Table 2

Illustrative financing arrangements by type of investment and SNG creditworthiness

Type of investment	SNG income level/creditworthiness		
	Low	Medium	High
Self-financing	Mix of loans (possibly subsidized) and transfers	Mix of loans (possibly subsidized) and bonds (if feasible)	Mix of bonds and loans
Partially revenue generating	Mix of loans (likely subsidized) and transfers	Mix of loans (possibly subsidized) and transfers	Mix of loans (possibly subsidized) and transfers (if justified)
Non-self-financing/ social purpose	Transfers only	Mix of loans (likely subsidized) and transfers	Mix of loans (possibly subsidized) and transfers (if justified)

Source: Paul Smoke, "Policies, reforms and strategies for enhancing subnational development finance", paper commissioned by United Cities and Local Governments, United Nations Capital Development Fund and UN-HABITAT for the expert group meeting of the Inter-agency Task Force on Financing for Development on subnational finance, United Nations Headquarters, 29 November 2017.

Property taxes are harder to avoid than many other types of taxes because real estate is not moveable. However, property taxes require development of a cadastral system for tracking ownership, along with continued updating of real estate valuations.

Capitalizing on the revenue potential of municipal assets

SNGs should consider whether they could better utilize the real estate they own and enhance the performance of utilities and commercial assets they control. Land is one of the most valuable municipal assets and SNGs may use land-value capture mechanisms as a financial tool, in particular for cities. These mechanisms follow the basic logic that enhanced accessibility to new infrastructure, such as mass transit systems, adds value to land and real estate. As this value premium results from public investments, SNGs should try to capture the surplus by using taxes or other mechanisms. Land exchange or land concessions need to be carefully managed to ensure transactions remain in the public interest. Also, environmental considerations need to be factored in, as “undeveloped lands” may provide important ecosystem services. In this respect, transparency around land ownership and permits for development is paramount to avoiding conflicts of interest and corruption.

2.2.2 Strengthening institutional frameworks for national/subnational interface

To make subnational finance a powerful instrument of development, strengthening the coherence and collaboration between central and subnational authorities is critical. Subnational development finance does not exist in a vacuum and there are a number of fundamental conditions that must be in place or developed over time:¹¹

- SNGs cannot play a developmental role unless they are empowered to act autonomously. A good institutional framework is expected to include **formal and clear assignment of functions and revenue gen-**

eration responsibility as well as systems and processes to support implementation;

- SNG operations should be sufficiently **transparent and accountable**. This includes downward accountability to citizens through elections and non-electoral means, and upward accountability to ensure that basic financial management procedures are followed and legitimate national goals and standards adhered to;
- SNGs need **the capacity and incentives to function effectively** (for example, to strengthen SNG financial and asset management systems and administer SNG taxes and fees);
- **Intergovernmental transfers should be made more predictable and transparent**. Stability will help local authorities to plan while reasonable flexibility on the use of transfers will allow SNGs to respond to local needs;
- Transfers should **contribute to global, national, and local development goals**, such as reducing disparities among SNGs and creating incentives to focus on SDGs. For example, it is possible to incorporate gender-equality objectives into the system of transferring national funds to lower levels of government in order to stimulate local governments’ commitment to incorporating gender-oriented goals in public policies.

2.2.3 Fostering access to sustainable long-term finance

Borrowing can be challenging for many SNGs. Capital markets in many developing countries are underdeveloped, and many SNGs are not creditworthy, so interest rates charged by domestic and international lenders are often unaffordable. The World Bank estimated that less than 20 per cent of the largest 500 cities in developing countries are deemed creditworthy in their local context, severely constricting their capacity to finance investments in public

¹¹ On this topic, see also Paul Smoke, “Policies, reforms and strategies for enhancing subnational development finance”, paper commissioned by UCLG, the United Nations Capital Development Fund (UNCDF) and UN-HABITAT for the expert group meeting of the Inter-agency Task Force on Financing for Development on subnational finance, United Nations Headquarters, 29 November 2017.

infrastructure, with only a fraction of the creditworthy cities able to issue municipal bonds.¹² Despite challenges, there are means to promote and support SNG access to long-term finance. Many countries have developed, or are developing, SNG borrowing and fiscal responsibility frameworks, which aim to provide a foundation for credible borrowing. Table 3 presents a variety of instruments, ranging from public to private, which SNGs may use, depending on national and local conditions and levels of investor confidence.

International public finance

Multilateral and national development banks can lend more widely to SNGs through innovative and responsible instruments (e.g., innovative credit enhancement for subnational loans and reduction of foreign exchange risks). Other initiatives are also desirable, such as means to improve the access of SNGs to climate-change financing mechanisms to facilitate investments in resilient and sustainable infrastructure. Development cooperation among SNGs, also known as decentralized development cooperation (DDC), is also emerging.¹³ From 2005 to 2015, DDC volumes grew by 1 per cent per year to \$1.9 billion in 2015 and represents 6 per cent

of bilateral ODA among members reporting on these volumes.¹⁴

Enhancing access to commercial finance

As noted above, a sound legal framework, careful planning, transparency, good governance, and financial sustainability are prerequisites to enabling SNG borrowing capacity. SNGs may create a separate legal entity, such as a special purpose vehicle (SPV), to borrow money for public infrastructure investments; the vehicle might have a higher credit rating than the SNG, since ownership of the municipal quality assets—such as public land and shares of public utilities—are typically transferred to it. The risk, however, is that these entities accumulate unsustainable amounts of debt and evade public oversight. Hence, transparency is critical to ensuring that debt levels are carefully monitored (see chapter III.E). Also, the level of sovereign guarantee provided by the national authorities for any subnational government borrowing should be made explicitly clear.

Ultimately, and with the right conditions in place, SNGs may be able to access capital markets and issue municipal bonds. Development banks can support municipalities in this process by issuing

Table 3
Subnational lending mechanisms / external source revenue

Management and finance	Ownership			
	Government agency	Government owned	Mixed public-private	Private entity
Lead institution	Ministry of Finance or local government	Development bank, fund or utility	Development bank or fund	Commercial banks, financial markets, private investors
Source(s) of finance	National budget or external donors	National budget, SNG contributions, external donors or financial institutions	National budget, SNG contributions, private investors, depositors, external investors	Private finance

Source: Paul Smoke, “Policies, reforms and strategies for enhancing subnational development finance”, paper commissioned by United Cities and Local Governments, United Nations Capital Development Fund and UN-HABITAT for the expert group meeting of the Inter-agency Task Force on Financing for Development on subnational finance, United Nations Headquarters, 29 November 2017.

- 12 See <http://www.worldbank.org/en/topic/urbandevelopment/brief/city-creditworthiness-initiative> and Daniel Platz and others, “Financing sustainable urban development in the least developed countries”.
- 13 Decentralized development cooperation (DDC) is defined as aid provided by the public sector other than the central government to developing countries.
- 14 Organization for Economic Cooperation and Development, *Decentralized Development Co-operation: Financial Flows, Emerging Trends, and Innovative Paradigms* (Paris, OECD Publishing, forthcoming).

guarantees that can help lower the cost of financing and/or lengthen the maturity of issuances.

Public-private partnerships (PPPs)

Public-private partnerships (PPPs) could potentially help SNGs secure expertise and funds from the private sector, particularly for revenue-generating projects. City-level PPPs are common in sectors such as public transport, water and housing. However, PPP projects tend to be complex and local authorities often lack the necessary capacity to both negotiate PPP deals and effectively regulate private operators. At the central level, many Governments have created PPP units to address this issue. Reinforcing the linkages between the central PPP unit and SNGs is a way to better support local authorities in their PPP projects.

Safeguards need to be in place to ensure the fiscal sustainability of these projects and preserve public interests, while guaranteeing access for the more vulnerable to public services. Enhancing the transparency of these deals should help strengthen accountability. A higher level of disclosure in PPP projects should also go hand in hand with more disclosure of publicly financed infrastructure projects (actual costs vs. budget), as this will support decision-making between PPP and traditional procurement in the future.

3. Water and sanitation

SDG 6 aims to achieve universal, equitable and affordable access to safely managed water, sanitation and hygiene. In contrast to the Millennium Development Goals, which focused on basic water supply and sanitation, SDG 6 is broader, aiming for safe and affordable drinking water and adequate sanitation and hygiene. It also covers water-use efficiency and integrated water resource management (including the need to protect and restore water-related ecosystems, which can provide water retention and purification services, and can present low-cost alternative solutions).¹⁵ The table below lays out different service delivery options by subsector.

Financing needs to meet SDG 6 are considerable. The World Bank estimates that global total capital costs of achieving universal access to safely managed water and sanitation services and hygiene are \$114 billion annually (or three times the historical financing trend), with needs well above average in sub-Saharan Africa and Southern Asia.¹⁶

The Global Analysis and Assessment of Sanitation and Drinking-water (GLAAS) 2016/2017 country survey estimates that 66 per cent of financing for water, sanitation and hygiene originates from household sources via tariffs and self-supply (e.g., household investments in toilets and wells). The

Table 4

Typical solutions by subsectors

	Water	Sanitation	Irrigation
Urban	Piped supplies (i.e., water distribution network) plus unregulated providers for the poor, unserved by public utilities	Networked sanitation (i.e., toilets connected to sewers) plus on-site sanitation in cities with no or limited sewer networks	
Rural	Piped and non-piped supplies (e.g., boreholes, rainwater, packaged water)	On-site sanitation (e.g., toilets connected to septic tanks or pit latrines)	Irrigation systems (mainly for agriculture purposes)

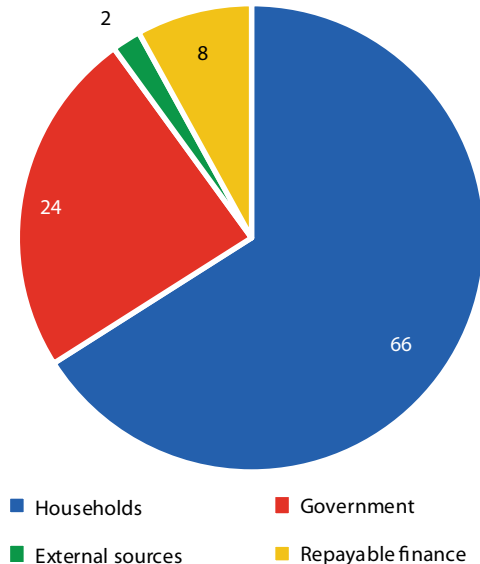
Source: UN/DESA.

¹⁵ The upcoming *United Nations World Water Development Report 2018* will focus on nature-based solutions for water and showcase the importance of considering fully nature-based solutions (in parallel with alternative approaches) in water management policy and practice. See <https://en.unesco.org/events/launch-world-water-development-report-2018>.

¹⁶ The \$114 billion figure represents a capital cost and does not include operation and maintenance costs. See Guy Hutton and Mili Varughese, "The costs of meeting the 2030 Sustainable Development Goal targets on drinking water, sanitation, and hygiene" (Washington, D.C., World Bank, 2016). Available from <https://openknowledge.worldbank.org/bitstream/handle/10986/23681/K8632.pdf?sequence=4>.

remainder comes through government taxes, external ODA and voluntary grants, as well as repayable finance such as loans.¹⁷

Figure 2
Financing sources for water, sanitation and hygiene



Source: UN-WATER and the World Health Organization, “Financing universal water, sanitation and hygiene under the Sustainable Development Goals: UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS 2017 Report)” (Geneva, World Health Organization, 2017).

Note: Figure is based on data for 25 countries.

3.1 Sector characteristics

Several key characteristics shape service provision in the water sector:

- **Natural monopoly characteristics** It is not economical to lay competing sets of pipes for water and sanitation network infrastructure, which severely limits competitive pressures on providers. For basic services, such as wells or on-site sanitation, households themselves are the primary investors;

- **Capital intensities** The network infrastructure also makes the sector capital intensive, with high-up front investment needs;¹⁸
- **Local provision** Water and sanitation services are usually locally provided, with limited options for wider-scale networks, so that service provision is often set up at the municipal level. Thus, the creditworthiness of local utilities determines the feasibility of raising private finance. For households and communities, small-scale financing options are necessary;
- **Equity considerations** Equity considerations severely limit the ability to apply cost-recovery tariffs for water services. Access to water and sanitation has to be provided to all households independent of their ability to pay. As a result, public subsidies are usually required, such as reduced tariffs and block tariffs structures (i.e., highly subsidizing the first few cubic meters to cover basic needs). Low-income households not connected to utility networks tend to have higher costs than wealthy people who are connected. Similarly, the financial burden is higher for rural citizens in sanitation as they do not benefit from public investment in urban sewerage systems;
- **Gender equality considerations** Even though lack of access to water affects all, women and girls are often the most affected as the primary users, providers and managers of water in their households. Where running water is unavailable at home, women and girls travel long distances to meet household water needs. Lack of adequate sanitation facilities may expose women and girls to illness, and to safety risks and violence at school, at work and in their communities—hampering their ability to learn, earn an income and move freely (see box 1);¹⁹

¹⁷ UN-WATER and the World Health Organization, “Financing universal water, sanitation and hygiene under the Sustainable Development Goals: UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS 2017 Report)” (Geneva, World Health Organization, 2017).

¹⁸ World Panel on Financing Water Infrastructure, “Financing Water for All” (2003). Available from <https://www.oecd.org/greengrowth/21556665.pdf>.

¹⁹ UN Women, *Turning Promises into Action: Gender Equality in the 2030 Agenda for Sustainable Development* (New York, UN Women, 2018).

- **Health considerations** Clean water prevents the occurrence of water-borne diseases and the associated health care costs;
- **Cash flows** In this sector, cash flows come from tariffs and user self-investments; taxes levied by local and national governments and provided to the sector as grants or subsidies; and transfers from external sources (e.g., donor assistance and philanthropy), which come in different forms with different agendas, and generally cannot be broadly used the way taxes and tariffs are. Transfers can also include cross subsidies where a service provider uses revenues from more affluent areas to subsidize less affluent ones.

3.2 Financing options

Equity considerations severely limit the ability to increase tariffs and fees.²⁰ The most recent GLAAS

country survey found that in more than half of all countries, household tariffs are insufficient even to cover operation and maintenance costs.²¹ To address the financing gap in the sector, utilities will have to combine different strategies, such as raising revenue sources for utilities, improving efficiency and tapping repayable finance (see figure 3).

3.2.1 Improving efficiency and creditworthiness

One of the most effective ways to reduce financing needs is to improve the technical and financial performance of water utilities. The World Bank estimates that with operational efficiency gains alone, without a tariff increase, 65 per cent of water utilities in developing countries would cover operational expenditures, up from just 15 per cent today.²²

Reducing non-revenue water (i.e., water in the distribution system not billed to customers or lost

Box 1

Integrating gender equality into WASH (water/sanitation/hygiene)

Water and sanitation is an area where basic infrastructure development can reduce the unpaid care and domestic work burdens for women and girls. Globally, it is estimated that women and girls spend 200 million hours per day gathering water.^a Additionally, the distance to the water supply can put women and girls at risk of violence. Therefore, “policy-makers must embed WASH in plans and budgets with interconnected objectives, such as health, nutrition and education. Cross-referencing between sectors will ensure all are better placed to reach their goals.”^b Ensuring water and sanitation policies and programmes are designed and implemented in a gender-responsive manner presents an opportunity to reduce and redistribute women’s unpaid care and domestic work, as well as improving health and education outcomes. This requires that water programmes reflect the integral roles of women and girls as providers, users and managers of water.

Gender-responsive budgeting can strengthen the capacity of sector ministries as well as local governments to conduct gender analysis and integrate gender priorities in water and sanitation policies, plans and programmes. These efforts also require the active participation of women in all stages of planning and budgeting decisions. For example, UN-Women has supported women’s engagement in local councils to advocate for their priorities on water quality and access to be reflected in plans and budgets. This has contributed to greater prioritization of these issues and increased resource allocations for water service delivery, with tangible benefits to women, girls and entire communities.

^a United Nations Children’s Fund, “Collecting water is often a colossal waste of time for women and girls”, press release. Available from https://www.unicef.org/media/media_92690.html.

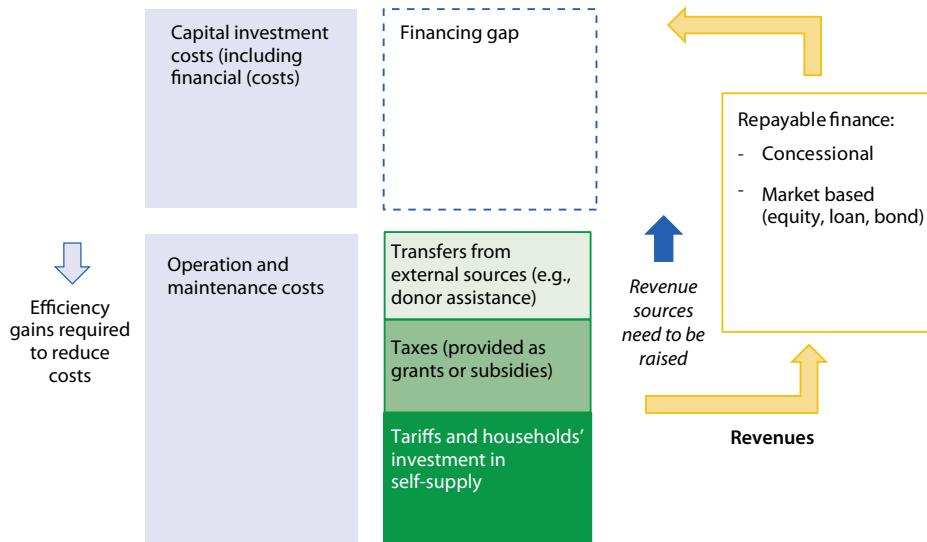
^b WaterAid, “How to reach everyone with safe water and sanitation by 2030” (London, WaterAid, 2018). Available from https://washmatters.wateraid.org/sites/g/files/jkxooof256/files/How_to_get_water_and_sanitation_to_everyone_by_2030_0.pdf.

²⁰ Organization for Economic Cooperation and Development, *Meeting the Challenge of Financing Water and Sanitation: Tools and Approaches*, OECD Studies on Water (Paris, OECD Publishing, 2011). Available from https://www.pseau.org/outils/ouvrages/ocde_meeting_the_challenge_of_financing_water_and_sanitation_2013.pdf. Whereas tariffs accounted for 90 per cent of funding in France, they only raised 30 per cent of funds in Mozambique and 10 per cent in Egypt.

²¹ UN-WATER and the World Health Organization, “Financing Universal Water, Sanitation and Hygiene under the Sustainable Development Goals”.

²² World Bank Group and United Nations Children’s Fund, “Sanitation and water for all: how can the financing gap be filled?” A discussion paper. World Bank, (Washington, D.C., March 2017).

Figure 3

Cost, funding and financing sources in the water and sanitation sector

Source: UN/DESA, Organization for Economic Cooperation and Development, Meeting the Challenge of Financing Water and Sanitation: Tools and Approaches, OECD Studies on Water (Paris, OECD Publishing, 2011).

through leaks) can boost operational revenues while decreasing capital expenditures. Reducing leaks also contributes to the objective of more sustainable production as less water needs to be introduced in the systems. Using local technology and ensuring timely maintenance can improve cost efficiency. Similarly, organizational improvements, such as enhanced labour productivity and higher collection rates, impact the performance of utilities.

Introducing and monitoring key performance indicators can be a way to trigger efficiency gains. For efficiency reasons, some countries have also delegated water services to private operators via PPPs and management contracts. These operators are incentivized to improve performance to generate profits. Other countries choose to maintain local control of service provision to have greater control over service provision and ensure universal access. Public-public partnerships (PUPs), such as partnerships among different public water utilities to exchange best practices and technical expertise, have also been established to enhance efficiency.

Sector regulation should contribute to reinforce accountability frameworks and clarify the roles and responsibilities of the different stakeholders.

For instance, distinguishing sector oversight from service provision is usually required to better align incentives and provide the necessary autonomy for service providers. Water regulation, which addresses elements such as tariffs, service quality standards, competition, consumer protection and pro-poor regulation, need to be transparent and applied independently of political interferences. Sector reforms are often the first step required to enable repayable finance.

3.2.2 Raising revenue sources for utilities

Another effective way to close the financing gap is to increase levels of public finance. This has the added benefit of demonstrating the Government's commitment to improving the sector's financial viability, which ultimately creates the condition for commercial finance. Recognizing this, countries have increased their budgets for water, sanitation and hygiene at an average annual rate of about 4.9 per cent over the last three years. However, the GLAAS 2016/2017 country survey shows that 80 per cent of countries have reported that the increase is still insufficient to meet nationally defined targets for those services.²³

²³ UN-WATER and the World Health Organization, "Financing Universal Water, Sanitation and Hygiene under the Sustainable Development Goals".

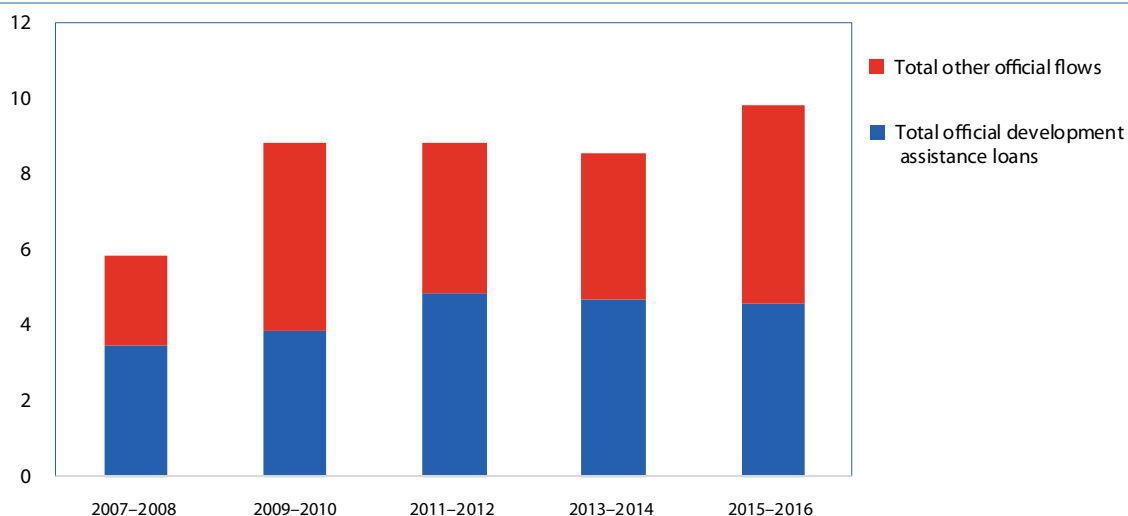
In some countries, international transfers help fill this gap, although ODA grants for water supply and sanitation have been on a declining trend, particularly over the last several years. ODA commitments reached \$3.8 billion in 2013, but dropped to \$2.5 billion in 2016 (in constant prices).²⁴

3.2.3 Tapping concessional loans and market-based/commercial finance

The bulk of repayable finance for developing countries has traditionally been lending by development finance institutions. While grants have decreased recently, ODA loans and other official flows increased to almost \$10 billion a year in 2015-2016, from a base of \$6 billion in 2007-2008 (see figure 4). While this is a positive trend, it might have currency risk implications for developing countries if these loans are in hard currency. Also, total borrowing from these institutions remains small relative to the annual requirements in the sector, which exceed \$100 billion. To significantly expand investment, utilities will need to increasingly tap commercial sources of finance, particularly domestic finance, where feasible, to avoid creating currency-exchange risks.

Figure 4

Trends in official development assistance loans and other official flows to water and sanitation (Billions of United States dollars, 2-year average commitment, constant 2015 prices)



Source: OECD Creditor Reporting Systems. Available from <https://stats.oecd.org/Index.aspx?DataSetCode=CRS1#> (accessed on 23 January 2018).

Explore the full continuum of commercial finance solutions

In developed countries, the water sector is perceived as low risk, which allows utilities to attract commercial lenders despite relatively low returns. In developing countries, the combination of low and uncertain returns makes the sector a challenging proposition for private investors. Without some level of certainty on utilities' capacity to implement tariff revisions, collect revenues and obtain regular funding from public authorities, private investors are unlikely to invest in the sector. To access commercial markets, the creditworthiness of utilities needs to be strengthened. This means improving their efficiency and developing appropriate institutions and regulatory frameworks. A strong and independent regulatory body could provide confidence to investors, while well-managed fiscal positions could help reassure investors about the capacity of public authorities to support the sector.

While utilities/municipalities are often the largest borrowers, several other types of entities borrow to finance water services:

²⁴ Organization for Economic Cooperation and Development, Creditor Reporting System, OECD.Stat. Available from <https://stats.oecd.org/Index.aspx?DataSetCode=CRS1> (accessed on 23 January 2018).

- **Households** may access microfinance for investment in water connections and vendor finance for purchasing toilets. This may be more economical than relying on water merchants on a daily basis. However, this requires having access to small and affordable loans that spread the upfront cost over time, especially those that minimize transaction and opportunity costs, such as through digital payment plans;
- **Small-scale independent providers** may offer solutions to unserved communities. They include pushcart vendors and water kiosks, which operate typically in the informal sector. This creates challenges to ensure service quality and avoid excessive rates. These providers nevertheless fill a gap in the absence of adequate service provided by public utilities. To operate and expand their businesses, they also need to access finance;
- **Communities and medium-sized entrepreneurs** also play a significant role in the sector. For example, in sanitation, community-based

organizations can manage public toilets while private operators may provide fecal sludge management services, such as latrine pit or septic tank emptying. Similarly, access to piped water can be provided through community taps or standpipes. Development partners, including non-governmental organizations (NGOs), can provide support to facilitate access to commercial finance for communities through capacity-building.

The figure below outlines the types of financial instruments that can access different borrowers.

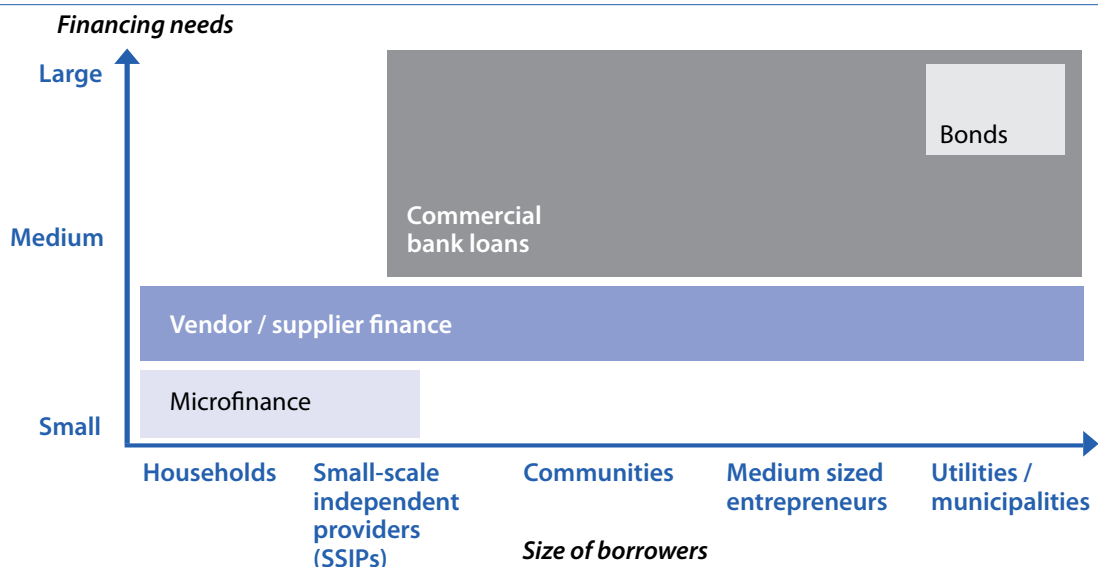
In addition to lending, the private sector can also provide equity investments. Many water utilities are traded on stock exchanges around the world, with the market capitalization of these companies estimated to exceed \$1 trillion.²⁵

Develop an incremental approach through blending strategies

To access commercial finance, borrowers need to be creditworthy, implying that utilities operating

Figure 5

Options for commercial finance



Source: Adapted from a presentation delivered by Joel Kolker, Lead Water and Sanitation Specialist, World Bank, at the technical meeting of the Inter-agency Task Force on Financing for Development, 1 December 2017.

²⁵ Summit Water Capital Advisors, "The case for water equity investing" (La Jolla, California, 2017). Available from <http://www.summitwatercapital.com/media/1019/case-for-water-equity-investing-2017-a021317.pdf>.

at a loss have to initially rely on grants as a source of finance, but could progressively access concessional and commercial finance once their performance improves.

Blending strategies can support this transition. These strategies use public resources to leverage additional finance. They share risks, soften lending terms, and support project development through technical assistance and capacity-building. They also help local banks become more familiar with lending to the water sector, and reduce risk perceptions through pilot projects. For example, the World Bank has been providing funds to local banks in Kenya to introduce loans, combined with output-based subsidies, to water utilities for projects in underserved rural and urban areas. Blending strategies are also attractive if the use of such instruments leads to greater transparency, accountability and efficiency gains in utilities.

4. Energy

SDG 7 aims to ensure access to affordable, reliable, sustainable and modern energy for all. Achieving this goal requires (i) providing electricity to the remaining 15 per cent of the world population without access (1 billion people, more than half of whom reside in LDCs); (ii) vastly increasing reliance on clean cooking fuels; and (iii) enhancing energy efficiency and the share of renewable energy.

Achieving SDG 7 will require significant investment, with annual needs estimated at \$45 billion for universal access to electricity; \$4.4 billion

for clean cooking; between \$442 and 650 billion for achieving the transition towards renewable energy compatible with climate goals; and \$560 billion for energy efficiency.²⁶ In all cases, investment needs considerably exceed current spending (e.g., renewable power capacity and energy efficiency investments amounted to \$242 billion and \$231 billion in 2016, respectively).²⁷ The investment costs for universal access to modern energy in LDCs alone are on the order of \$12 billion to \$40 billion per year from now until 2030.²⁸

Historically, public utilities have generated and distributed electricity and funded their operation and capital investments from end-users (retained earnings from tariffs), subsidies by the public sector, and, in developing countries, through development assistance. In recent decades, many countries, particularly developed countries, have increased private sector participation in the sector, primarily in electricity generation (since transmission and distribution networks have natural monopoly characteristics).²⁹ Decentralized energy solutions, such as mini-grids and off-grids, also rely primarily on private investments, either from enterprises or households directly.³⁰

The following sections aim to unpack the possible roles of public and private finance by examining actions required in the sector, including bridging the access gap, promoting energy efficiency investments, fostering investments in renewables, and putting a price on carbon.

²⁶ Sustainable Energy for All, “Global Tracking Framework. Progress toward Sustainable Energy 2015” (Washington, D.C., World Bank and the International Energy Agency (IEA), 2015). Available from <http://www.se4all.org/sites/default/files/GTF-2105-Full-Report.pdf>.

²⁷ Frankfurt School-United Nations Environment Programme Collaborating Centre and Bloomberg New Energy Finance, “Global Trends in Renewable Energy Investment 2017” (Frankfurt, Germany, Frankfurt School of Finance & Management, 2017). Available from <http://fs-unep-centre.org/sites/default/files/publications/global-trends-in-renewable-energy-investment-2017.pdf>; International Energy Agency, “Energy Efficiency 2017”, Market Report Series (Paris, OECD/ IEA, 2017). Available from http://www.iea.org/publications/freepublications/publication/Energy_Efficiency_2017.pdf.

²⁸ *The Least Developed Countries Report 2017* (United Nations publication, Sales No. E.17.II.D.6, 2017).

²⁹ International Energy Agency, “World Energy Investment 2017”, Executive Summary (Paris, OECD/IEA, 2017). Available from <https://www.iea.org/Textbase/npsum/WEI2017SUM.pdf>.

³⁰ Mini-grids are defined as localized power networks, usually without infrastructure to transmit electricity beyond their service area, while off-grid systems are not connected to a grid and typically power single households. Decentralized systems include both (International Energy Agency, “Energy Access Outlook 2017”, World Energy Outlook (WEO) series, (Paris, OECD/IEA, 2017). Available from https://www.iea.org/publications/freepublications/publication/WEO2017SpecialReport_EnergyAccessOutlook.pdf.

4.1 Bridging the access gap: clean cooking fuels and access to electricity

More than 3 billion people use polluting cooking fuels, such as wood and charcoal, primarily in rural areas and poor urban neighbourhoods.³¹ The health impacts of these fuels can be particularly devastating for women and children, who usually spend more time in the home. Likewise, in terms of issues such as deforestation and CO₂ emissions, environmental externalities are large. The social cost is estimated at \$123 billion annually,³² far above the investment needed to achieve clean cooking.

Providing universal access to electricity is achieved either through a power grid connected to large power plants, or via decentralized systems. Almost all of those who gained access to electricity from 2000 to 2016 did so through grid connection, yet decentralized systems are estimated to be the most cost-effective solution for over 70 per cent of those expected to gain access to electricity in rural areas by 2030.³³ Such distributed solutions rely primarily on private investments and third-party ownerships (e.g., energy services companies and households).

Bridging the access gap, both for clean cooking fuels and electricity, necessitates tackling affordability constraints of poorer households. While these households are already dedicating significant resources to pay for lighting and cooking fuels, many are unable to finance capital investments for modern solutions, such as solar panels or improved cookstoves. This is particularly true for women, who still have less access overall to financial assets, which further constrains their ability to purchase these energy solutions.³⁴

While commercial banks are reluctant to lend to low-income households, alternatives exist such as pay-as-you-go systems, third-party ownership models, or microloans. Technology is making these solutions more efficient, for instance, through remote metering and online payments that reduce transaction costs, improve collection rates, and align interests of companies and consumers.

Consumer finance lets borrowers spread costs over time, although regular payments from households are still required. Hence, affordability also rests on the capacity to reduce the cost of sustainable solutions. Providing better access to finance is a way to support entrepreneurs in developing cost-efficient solutions. For example, in many parts of the world, the cookstove and fuels market remains fragmented and dominated by artisanal and semi-industrial solutions provided by small and medium-sized enterprises, which often suffer from limited access to capital. Addressing this challenge could allow these companies to develop their businesses, innovate, and eventually provide better performing and more affordable solutions. Likewise, energy enterprises providing off-grid solutions may struggle to mobilize financing, as this market segment has only received a small share of overall development financing for electricity access.³⁵ Another key aspect in the pursuit and development of effective and sustainable solutions is the further involvement of women, who have positively influenced the market as clean energy entrepreneurs.³⁶

There is a role for the public sector, including for development finance institutions, to improve access to finance and support market development, through performance-linked subsidy approaches, for instance.

31 Report of the Secretary-General on progress towards the Sustainable Development Goals (E/2017/66). Available from http://www.un.org/ga/search/view_doc.asp?symbol=E/2017/66&Lang=E.

32 Venkata Ramana Putti and others, "The state of the global clean and improved cooking sector", Energy Sector Management Assistance Program (ESMAP) Technical Report No. 007/15 (Washington, D.C., World Bank, 2015). Available from <https://openknowledge.worldbank.org/bitstream/handle/10986/21878/96499.pdf>.

33 International Energy Agency, "Energy Access Outlook 2017".

34 Globally, only 9.6 per cent of females borrowed from a financial institution in 2014 compared to 11.8 per cent for males (World Bank, Global Financial Inclusion database). Available from <http://databank.worldbank.org>.

35 See, for example, Sustainable Energy for All, "Energizing finance. Scaling and refining finance in countries with large energy access gaps", Energizing Finance Report Series (Vienna and Washington, D.C., 2017). Available from http://www.se4all.org/sites/default/files/2017_SEforALL_FR4_PolicyPaper.pdf.

36 Anita Shankar, "Strategically engaging women in clean energy solutions for sustainable development and health" (New York, Global Sustainable Development Report (GSDR) Brief, 2015). Available from https://sustainabledevelopment.un.org/content/documents/631479-Shankar-Women_in_Clean_Energy_Solutions.pdf.

There may also be a need for targeted subsidies for the poorest consumers and for female-headed households, although the sustainability of these schemes should be carefully assessed. Public authorities should raise awareness regarding the benefits and feasibility of sustainable solutions. For example, despite the benefits of switching fuel for cooking, lack of public awareness prevents a wider adoption of cleaner solutions, such as improved cookstoves or modern fuel stoves (e.g., LPG and electric). Anecdotal evidence suggests that a majority of rural wood collectors in Africa and Asia are willing to purchase improved cooking appliances once they become aware of the benefits.³⁷

4.2 Promoting energy efficiency investments through regulation

Enhancing energy efficiency reduces the need for added generation capacity and improves energy security, while also contributing to the objectives of more sustainable consumption and production. Investments in this sector cover a wide range of activities, with the building sector receiving the most, followed by transport and industry.³⁸ These investments can be self-financing since they generate cash flows from savings on energy bills. However, payback periods can typically be long, making investments sensitive to financing costs and energy prices. Additional market failures also impede investment. For example, the absence of information about the energy performance of buildings prevents buyers from incorporating this into their investment decisions and denies owners an incentive for making necessary improvements. Regulation can address some of these issues, through minimum energy-efficiency standards in building codes, for instance.

4.3 Fostering investments in renewables

Power generation assets typically last for a few decades, and today's investments lock in decisions for

the future. It is therefore critical to fast-track the transition towards renewables.

4.3.1 The economics of renewables

The economics of renewables are changing rapidly, providing additional momentum for the sector, with the cost of solar PV and wind now within the cost range of fossil fuels.³⁹ The decline in prices has been associated with a surge of investments, which increased six-fold between 2005 and 2015, before falling somewhat in 2016. Yet, 2016 was a record year in terms of installed renewable capacity, which represented about 60 per cent of the net power-generating capacity added that year.⁴⁰ The growth in investments was particularly strong in large emerging economies such as China.

Mechanisms to encourage renewable energy investments include tax incentives and feed-in tariffs. As the price difference between technologies decreases and, in some cases, is eliminated, the need for such mechanisms will decline, as will the associated regulatory and political risks. This should allow countries to envisage more ambitious targets for renewable energy (e.g., by requiring a higher percentage of power generated from renewables and/or auctioning larger amounts of generation capacity from renewables).

The growing share of project finance structures over time, as opposed to on-balance sheet finance by utilities, also suggests that banks are becoming more comfortable with the risk of lending to large renewable projects.⁴¹ The rise of green bonds should provide additional financing to the sector (see chapter III.B).

However, despite the sharp drop in costs, investments in renewables remain more expensive than fossil fuel alternatives in many situations. There is thus a continued need for the public sector to support the energy transition, including through development banks. Regulatory improvements, such as enhancing contract enforcement and facilitating permit issuance, can be more cost effective than

³⁷ Venkata Ramana Putti and others, "The State of the Global Clean and Improved Cooking Sector".

³⁸ International Energy Agency, Energy Efficiency 2017.

³⁹ See International Renewable Energy Agency (IRENA) LCOE 2010-2016. Available from <http://resourceirena.irena.org/gateway/dashboard/index.html?topic=3&subTopic=1057>, accessed 15 March 2018.

⁴⁰ Frankfurt School-United Nations Environment Programme Collaborating Centre and Bloomberg New Energy Finance, "Global Trends in Renewable Energy Investment 2017".

⁴¹ Ibid. Project finance accounted for 14 per cent in 2004 compared to 46 per cent in 2016.

using public capital. Specific issues related to the transition—stranded assets, or newly arising challenges with higher market penetration of renewables, such as storage costs and possible baseload issues—would also need to be addressed.

4.3.2 Enhancing the risk-return profile of renewable investments

Similar to the water sector, there is a wide range of ownership models for energy projects, from pure public to pure private. One goal of the ownership structure is to allocate risks to the parties best able to manage and control them. An ideal risk allocation would allow a project to achieve cost-efficient service delivery, and positively influence the project costs and feasibility (see box 2). Governments can use additional policy and financing instruments to further address mismatches between ideal and actual risk allocation, including through blended finance mechanisms,⁴² although care should be taken not to build up unsustainable contingent liabilities or take on risks that cannot be managed.

One example of private involvement in power generation is the independent power producer model. In this model, a private consortium builds, operates and maintains a power plant and sells the electricity generated to an off-taker, generally a state-owned utility, via a power purchase agreement.⁴³ Private investors are generally well placed to manage operational and construction risks because shareholders will exert pressure on the management to limit costs and delays. In contrast, policy risks are typically better understood and managed by public entities.⁴⁴

The ideal risk allocation also depends on the nature of the energy technology. For example, pri-

vate investors in combined cycle gas turbine are in a strong position to hold price and curtailment risks due to the technology's flexibility.⁴⁵ However, onshore wind investors have limited ability to manage these risks—a possible argument for the public sector to take it on. The ideal risk allocation might also differ across countries. Currency risk is high in countries where long-term local currency loans are not available, while this is less of an issue in countries where capital markets are well developed.

4.4 Putting a price on carbon

As noted at the start of this chapter, externalities, like carbon emissions, are side effects of business activity that are not incorporated into private returns. Carbon pricing transfers the cost burden to those responsible for emission, thus driving efficiency improvements and supporting the renewable transition. There are two main carbon-pricing mechanisms. *Emission-trading schemes* set a cap on the level of emissions, and issue a limited number of permits to emitting companies. Those exceeding their allocation buy permits from those achieving carbon reduction, thus setting a price on carbon. This creates a market price for greenhouse gas (GHG) emissions. The second mechanism is a *carbon tax*, which sets a price on carbon, although without specifically defining emission reduction targets.

As of 2017, 42 countries and 25 subnational jurisdictions (cities, states, and regions) are putting a price on carbon, with the value of these mechanisms reaching \$52 billion (an increase of 7 per cent over 2016).⁴⁶ However, the vast majority price carbon at less than \$10/tCO₂, far below the international recommendation of at least \$40-80/tCO₂ by 2020

⁴² Will Steggals, David Nelson and Gaia Stigliani, “Financing clean power: a risk-based approach to choosing ownership models and policy/finance instruments”, Climate Policy Initiative Working Paper (Climate Policy Initiative, September 2017). Available from <https://climatepolicyinitiative.org/publication/financing-clean-power-risk-based-approach-choosing-ownership-models-policy-finance-instruments/>.

⁴³ Power purchase agreements aim to provide certainty regarding the project revenues and make the project financially viable.

⁴⁴ For example, policy changes impacting the project revenues or costs, such as reduction in subsidies.

⁴⁵ Curtailment occurs when power plant operators are requested to reduce their output, for instance when transmission lines are congested or when there is an excess of supply. This results in foregone earnings, particularly for renewables that do not save on fuels.

⁴⁶ Richard H. Zechter and others, “State and Trends of Carbon Pricing 2017”, Working Paper (Washington, D.C., World Bank, Ecofys and Vivid Economics, November 2017). Available from <http://documents.worldbank.org/curated/en/468881509601753549/pdf/120810-REVISED-PUB-PUBLIC.pdf>.

and \$50-100/tCO₂ by 2030.⁴⁷ This implies that the cap is set too high, so that there is too much supply. However, political will to tighten the cap on emissions, and thus raise costs for companies, appears to be limited. Geographical coverage also remains limited as existing initiatives only cover 15 per cent of global GHG emissions. Extending these initia-

tives and raising carbon prices would generate hundreds of billions of dollars, while driving economic actors towards more sustainable consumption and production.

Some companies and development banks utilize internal carbon pricing to guide their decisions. Over 1,300 firms use or are planning to use

Box 2

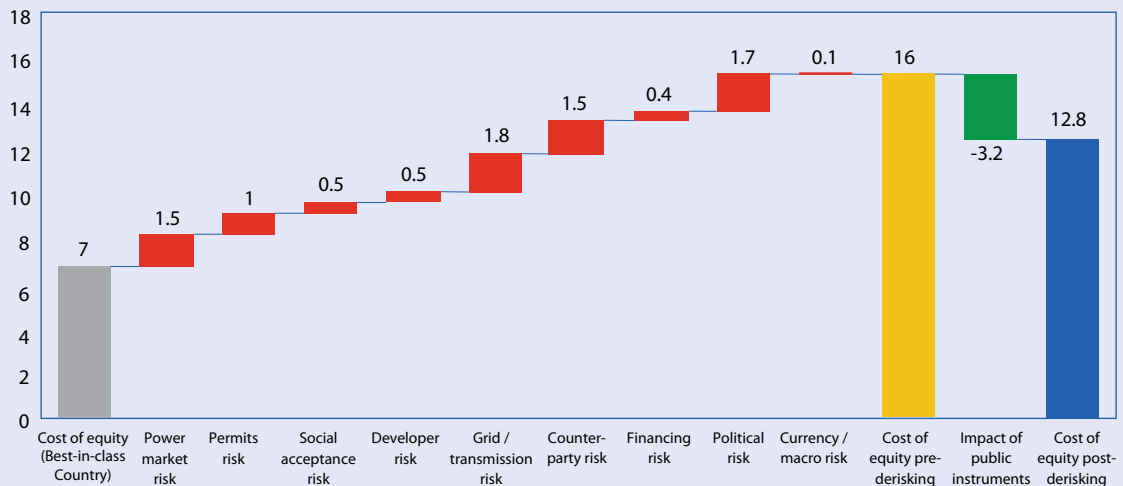
Risk premium for renewable energy investment

Private investors' decision-making is based on an evaluation of returns compared to risks. Investments face a variety of risks, each of which can be valued and quantified. Expected returns need to compensate investors for the total risk of the project (with the extra return called the risk premium). The risk premium is generally a bit less than the sum of the individual risks, due to diversification. The figure below illustrates different project risks for an investment in utility-scale renewable energy in a developing country. Since the cost of financing represents a significant share of renewable energy project costs, reducing risk premiums should make these projects more competitive vis-à-vis fossil fuel solutions. In the example, the risk premium (before government intervention) is about (or a bit less than) 9 per cent (i.e., the sum of the individual risk factors), with transmission risk and geopolitical risk being the most significant. After government interventions, the net risk premium is reduced to 5.8 per cent, reflecting the risk factors in the Lebanese market. Policymakers can target these risks with public instruments, for example via streamlining processes for permits, or including "take-or-pay" clauses to address transmission risks.^a

^a This means the generator is paid for potential rather than actual output and does not suffer if the grid operator is not capable of absorbing the power generated.

Figure 2.1

Equity financing cost (Solar PV)— example from Lebanon (Percentage)



Source: Oliver Waissbein and others, "Derisking renewable energy investment (New York, United Nations Development Programme, April 2013). Available from http://www.undp.org/content/undp/en/home/librarypage/environment-energy/low_emission_climateresilientdevelopment/derisking-renewable-energy-investment.html.

⁴⁷ Joseph E. Stiglitz and others, "Report of the high-level commission on carbon prices", Carbon Pricing Leadership Coalition (Washington, D.C., World Bank, 29 May 2017). Available from https://static1.squarespace.com/static/54ff9c5ce4b0a53deccfb4c/t/59b7f2409f8dce5316811916/1505227332748/CarbonPricing_FullReport.pdf.

Box 3

The World Bank's carbon shadow price

The World Bank recently introduced the application of a shadow price of carbon in the economic analysis for all International Bank for Reconstruction and Development (IBRD)/International Development Association (IDA) projects in key high-emitting sectors. The application of a shadow carbon price contributes to greater transparency and consistency regarding the climate impacts of World Bank's projects, thereby allowing better decision-making by the Bank and its clients. The World Bank 2017 Guidance Note on Shadow Price of Carbon recommends the use of a *low* and *high* estimate of the shadow carbon price starting at \$40 and \$80 (undiscounted, real values), respectively, per ton of CO₂e in 2020, rising to \$78 and \$156 per ton of CO₂e by 2050.^a The use of a low and high carbon shadow price reflects the uncertainty linked to the unpredictability of future socioeconomic and technological trends as well as the need to consider the country context.

- a World Bank, "Guidance note on shadow price of carbon in economic analysis" (Washington, D.C., World Bank, 12 November 2017). Available from <http://pubdocs.worldbank.org/en/911381516303509498/2017-Shadow-Price-of-Carbon-Guidance-Note-FINAL-CLEARED.pdf>.

this mechanism in the coming two years.⁴⁸ Box 3 illustrates how the World Bank is applying internal carbon pricing in its operation.

5. Terrestrial ecosystem

SDG 15 aims to protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation, and halt biodiversity loss. Healthy ecosystems provide humanity with services fundamental to well-being. Biodiversity underpins the resilience of ecosystem services, which provide food and clean water, buffer the impact of climate change, control the outbreak of diseases and support nutrient cycling. There are several intergovernmental processes that contribute to these objectives, such as the Convention on Biological Diversity, the United Nations Convention to Combat Desertification, and the United Nations Forum on Forests.

Yet progress in preserving and sustainably using ecosystems and biodiversity is uneven. The

pace of forest loss has slowed and improvements continue to be made in managing forests sustainably and in protecting areas that are important for biodiversity. However, declining trends in land productivity, biodiversity loss, and poaching and trafficking of wildlife remain serious concerns.⁴⁹ Women, particularly those from landless and land-poor households, are among the most affected by these trends. Due to their lack of access to private land, poor rural women depend more than men on common pool resources, such as forests, and their responsibility for meeting household food and fuel needs means that they are particularly affected by the depletion of natural resources.⁵⁰

Financing needs for preserving ecosystems range from \$150 billion to \$400 billion annually, while current financing is estimated at roughly \$50 billion annually.^{51,52} Financing needs projections include activities for restoring ecosystems or establishing protected areas; administrative resources to manage such programmes; and compensation pay-

48 Richard H. Zechter and others, "State and Trends of Carbon Pricing 2017".

49 Report of the Secretary-General on progress towards the Sustainable Development Goals (E/2017/66). Available from http://www.un.org/ga/search/view_doc.asp?symbol=E/2017/66&Lang=E.

50 UN Women, *Turning Promises into Action*.

51 CBD High-level Panel, *Resourcing the Aichi biodiversity targets: a first assessment of the resources required for implementing the strategic plan for biodiversity 2011-2020. Second report of the high-level panel on global assessment of resources for implementing the strategic plan for biodiversity 2011-2020* (Montreal, Canada, Secretariat of the Convention on Biological Diversity, 2014). Available from <https://www.cbd.int/financial/hlp/doc/hlp-02-report-en.pdf>.

52 Current financing estimates are from 2010 to 2015. See United Nations Development Programme, "The 2016 BIOFIN workbook: mobilizing resources for biodiversity and sustainable development", The Biodiversity Finance Initiative (New York, United Nations Development Programme, 2016). Available from http://www.biodiversityfinance.net/sites/default/files/content/publications/undp-biofin-web_0.pdf.

ments for income foregone for actions to conserve biodiversity (e.g., incentive payments for sustainable agriculture and land purchases). It is projected that only a minority of the identified investment needs will be covered through dedicated nature conservation budgets, which make up only about 20 per cent of the estimated total global resources required.⁵³

The challenge is to increase available resources—first and foremost from public sources but also by generating revenues from other sources of funding—and realigning existing expenditures towards more sustainable practices. These measures would in turn reduce needs by avoiding future costs.

5.1 Sector characteristics

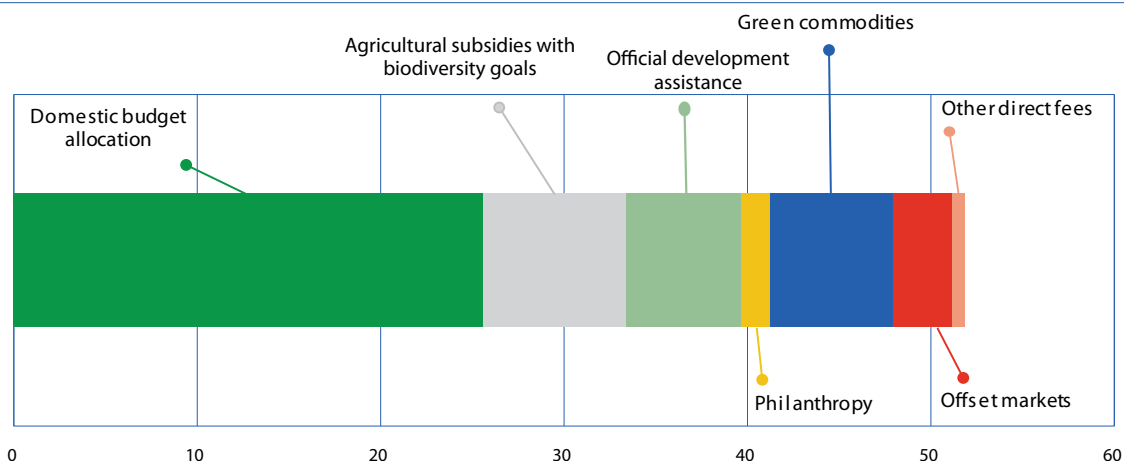
In contrast to water and energy, ecosystem protection has public-good characteristics in that beneficiaries cannot be separated from non-beneficiaries and charged accordingly. Investments in ecosystem

protection thus usually offer little opportunity for profit. When profit opportunities exist, such as sustainable farming, returns typically are not competitive with alternative use of land. Yet, once ecosystems are degraded below a certain threshold, their restoration becomes costly, if not impossible, and the services provided must be replaced at high cost. Moral entreaties to guard the biosphere are typically not sufficiently effective; only policy prohibitions and incentives are reliable—and even then, there will often be strong incentives to bypass regulation (e.g., illegal logging).

5.2 Financing options

Financing for ecosystem protection comes overwhelmingly from public sources, either domestic budgets or through international support, such as ODA. Some Governments also offer public subsidies with biodiversity goals.⁵⁴ Another financing source

Figure 6
Annual biodiversity finance by mechanisms estimated for 2010
(Billions of United States dollars)



Source: Adapted from Charlie Parker and others (eds.), *The Little Biodiversity Finance Book* (Oxford, United Kingdom, Global Canopy Programme, 2012) and “The 2016 BIOFIN workbook: mobilizing resources for biodiversity and sustainable development” The Biodiversity Finance Initiative (New York, United Nations Development Programme, 2016). Available from http://www.biodiversityfinance.net/sites/default/files/content/publications/undp-biofin-web_0.pdf.

⁵³ CBD High-level Panel, *Resourcing the Aichi biodiversity targets*.

⁵⁴ However, agricultural subsidies in OECD countries potentially harmful to the environment (e.g. market price support and output-based payments) largely exceed subsidies with biodiversity goals. Although on a declining trend, the former stood at about \$130 billion per year in 2012–2014 according to the OECD. See “Draft agenda and issues. Meeting of the Environmental Policy Committee (EPOC) at Ministerial level 28–29 September 2016”, OECD Conference Centre (Paris, OECD, 2016). Available from <https://www.oecd.org/environment/ministerial/agenda/ENV-Ministerial-Agenda-Issues-2016.pdf>.

is philanthropy, which provides around \$2 billion to the sector and finances the work of civil society organizations active in the sector (e.g., World Wildlife Fund, The Conservation Fund).

There are also market mechanisms that create funds for the sector. Green commodities, such as certified agriculture and timber markets, are gaining traction and foster sustainable production. Direct revenues for biodiversity activities, including offset markets and fees for ecosystem services, provide the rest of the financing (see figure 6).

5.2.1 Mobilizing additional resources

National budget allocations

Budget allocations have increased for biodiversity-related public expenditures; however, the trend needs to be solidified and further broadened.⁵⁵ At the national level, Governments should develop coherent plans to preserve ecosystems,

which should be embedded in broader national development planning and budgeting processes. The development of such plans is a key goal of the biodiversity finance initiative BIOFIN, managed by the United Nations Development Programme, and also responds to the targets for resource mobilization for implementing the Strategic Plan for Biodiversity 2011-2020 and its Aichi Biodiversity Targets.

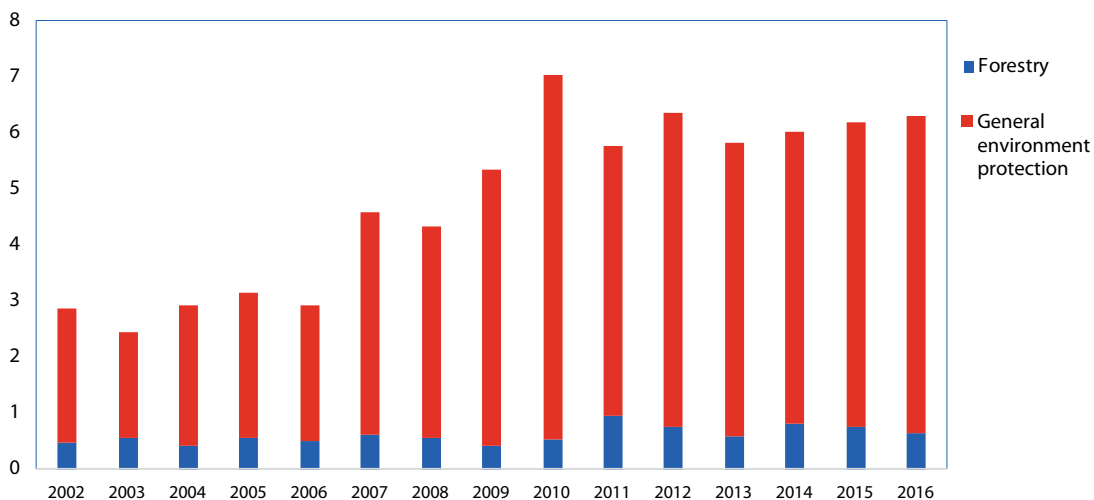
Scaling up ODA resources

In 2014, the Parties to the Convention for Biodiversity decided to double biodiversity related financial aid to developing countries through 2020, and while some countries have reached this target, collectively, donors still fall short.⁵⁶ This trend is mirrored in forestry-specific ODA, which has increased over the last 15 years, but has plateaued since 2012 (see figure 7).

Different mechanisms are available to channel additional concessional resources. In particular,

Figure 7

Official development assistance commitments to forestry and environment protection (Billions of United States dollars, (constant 2015 price))



Source: OECD Creditor Reporting Systems. Available from <https://stats.oecd.org/Index.aspx?DataSetCode=CRS1#>.

⁵⁵ Convention on Biological Diversity, “Analysis of the information provided through the financial reporting framework and of methodological information and definitions as provided by parties (UNEP/CBD/COP/13/11/Rev1). Available from <https://www.cbd.int/doc/meetings/cop/cop-13/official/cop-13-11-rev1-en.doc>.

⁵⁶ Convention on Biological Diversity, “Draft global monitoring report on financing for biodiversity”. Available from <https://www.cbd.int/doc/meetings/sbi/sbi-01/information/sbi-01-inf-46-en.doc>.

REDD+,⁵⁷ which features in article 5 of the Paris Agreement of the United Nations Framework Convention on Climate Change, enables developing countries to receive payments proportional to the reduction of their greenhouse gas emissions from slowing deforestation and forest degradation against a pre-agreed deforestation baseline scenario. REDD+ breaks down into three phases:

- (i) Readiness (capacity-building and preparation of a national REDD+ strategy);
- (ii) Transition (demonstration activities and piloting);
- (iii) Implementation (results-based payments).

Phases one and two have entirely depended on upfront funding, usually in the form of ODA, while phase-three funding is delivered once countries show evidence of emissions reductions from forests and land use. After almost a decade of working on phases 1 and 2 of REDD+, in October 2017 phase 3 started in earnest with a \$500 million pilot programme approved by the Green Climate Fund on REDD+ results-based payments.⁵⁸

Monetizing externalities

Payments for ecosystem services have often been branded as the solution for “internalizing externalities” in this sector, although to date, only small-scale payments have been made. However, some larger-scale initiatives may be underway. For instance, under pressure from environmental NGOs and consumers, large food companies have begun committing voluntarily to applying the “zero-deforestation” commodity principle, in recognition of the fact that key agricultural commodities account for 71 per cent of tropical deforestation.⁵⁹

Biodiversity offsets follow the same concept as carbon offsets to combat global warming, but compensate biodiversity impacts associated with economic development (e.g., habitat banks in the United States of America). Tax policies are another tool that can increase resources while raising relative prices of activities that negatively impact ecosystems—for instance, with taxes on fuels, pesticides and the use of natural capital, such as timber.

Tapping investors

Although still small, there is also increasing interest in mobilizing financing for ecosystem projects through development banks and impact investors. An example is the first-loss guarantees and subordinated loans provided by the Global Environment Facility (GEF) for land restoration projects in Latin America under the Risk Mitigation Instrument for Land Restoration. The instrument combines a GEF investment of \$15 million to leverage \$120 million of co-financing (including loans from the Inter-American Development Bank and equity investments from impact investors) by reducing the projects’ perceived risks. This financial instrument aims to bring low productivity land into production, such as for increased ecosystem services and high-value forest products.

The 2017 Global Impact Investing Network annual survey estimates that around \$4.5 billion of assets are allocated to the forestry and timber sector, although mainly in Canada and the United States.⁶⁰ To support sustainable land use, the Land Degradation Neutrality Fund was launched in 2017 at the thirteenth session of the Conference of the Parties (COP 13) of the United Nations Convention to Combat Desertification. The fund is privately managed and intends to raise capital from public and private investors (the target size is \$300 million). It will

⁵⁷ The United Nations Framework Convention on Climate Change defines REDD+ as “reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries” (see http://unfccc.int/land_use_and_climate_change/redd/items/7377.php).

⁵⁸ Green Climate Fund, “GCF in brief: REDD+”. Available from <https://www.greenclimate.fund/documents/20182/194568/GCF+in+Brief+-+REDD%2B/6ad00075-1469-4248-a066-8a8e622edacd>.

⁵⁹ Sam Lawson and others, “Consumer goods and deforestation: an analysis of the extent and nature of illegality in forest conversion for agriculture and timber plantations”, Forest Trends Report Series (Washington, D.C., Forest Trends, September 2014). Available from http://www.forest-trends.org/documents/files/doc_4718.pdf.

⁶⁰ See https://thegiin.org/assets/GIIN_AnnualImpactInvestorSurvey_2017_Web_Final.pdf.

invest equity and junior debt in profit-generating sustainable land management and land restoration projects worldwide.⁶¹ Given that it is looking for investments that are profit generating, one challenge will be to develop enough investment proposals that create cash flows together with measurable conservation impact.

Scaling up also requires facilitating the identification of sustainable projects. In this respect, the Climate Bonds Initiative is developing standards for bond issuers looking to finance land-use projects, such as afforestation. Establishing recognized standards should reduce transaction costs for investors (see chapter III.B).

5.2.2 Realigning expenditures and activities

Aligning private investments with sustainable development

Aligning existing private finance flows with sustainable development is critically important for ecosystem preservation. For example, while a considerable amount of private money flows into the forest sector, it often contributes to unsustainable models, and funds to protect ecosystems are concentrated in some regions. In 2011, annual total private forest plantation in developing countries was estimated at \$1.8 billion, with 83 per cent in Latin America, but only 1 per cent in Africa.⁶² Addressing the sector challenges requires shifting from unsustainable to sustainable practices and changing the economic drivers. For instance, landowners will continue to clear natural forest if they can convert it to more lucrative agricultural production. Land-use regulation and public

ownership is a way to address this issue. Public policies can also promote corporate sustainability, including reporting on environmental, social and governance impacts to enhance accountability of private companies. In addition, development finance institutions can make their financing conditional on following strict environmental standards.⁶³ These actions need to be complemented by measures addressing the economic drivers behind unsustainable practices, such as externalities and harmful financial incentives.

Transforming the incentive structure

“Green commodities” have proven their capacity to change behaviours. In this model, consumers pay a price premium for goods that are produced sustainably—for example, products that are certified compliant with sustainability standards by a third party through labelling. Forest product certification labels such as FSC and PEFC⁶⁴ are just two examples. Based on the zero-deforestation principle, initiatives are underway to apply similar mechanisms to food products conducive to tropical deforestation, such as soy, beef and palm oil.

Public policies should be designed to favour long-term conservation objectives over short-term exploitation. Subsidies to sectors such as soy, beef or palm oil dwarf public financing for preventing deforestation and forest degradation (see figure 8). Eliminating, phasing out or reforming harmful subsidies, in line with Aichi Biodiversity Target 3, would reduce incentives for unsustainable production patterns. Some of these subsidies could also be redirected to ecosystem conservation activities.

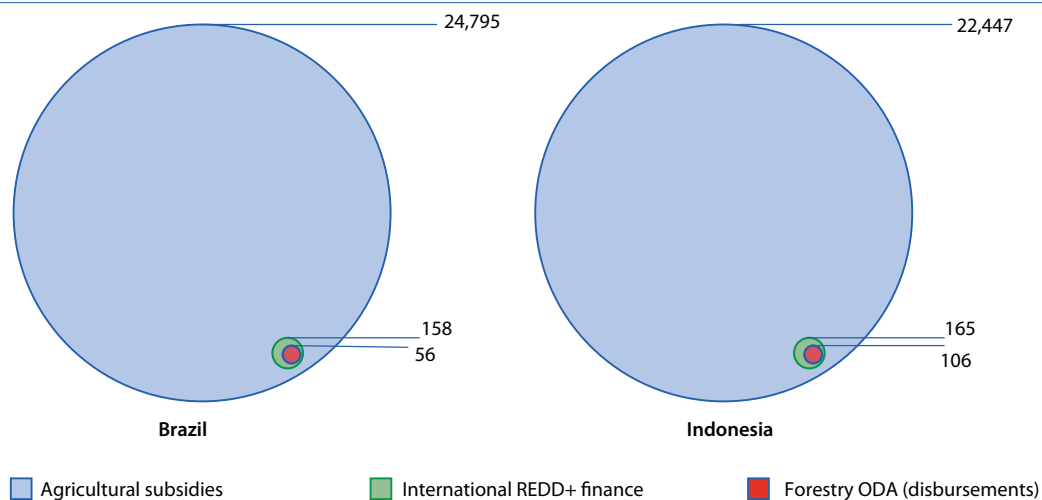
⁶¹ For more information, see <http://www2.unccd.int/sites/default/files/relevant-links/2017-09/LDN%20Fund%20brochure%20-%20Aug2017.pdf>.

⁶² Tuukka Castrén and others, *Private Financing for Sustainable Forest Management and Forest Products in Developing Countries: Trends and drivers* (Washington, D.C., Program on Forests (PROFOR), 2014).

⁶³ Addis Ababa Action Agenda para. 17. Available from http://www.un.org/esa/ffd/wp-content/uploads/2015/08/AAAA_Outcome.pdf.

⁶⁴ FSC stands for Forest Stewardship Council and PEFC for Programme for the Endorsement of Forest Certification.

Figure 8

Agricultural subsidies versus forest finance*(Millions of United States dollars)*

Source: B. Singer, “Financing sustainable forest management in developing countries: the case for a holistic approach” *International Forestry Review*, vol. 18, No. 1 (2016) pp. 96–109; and Will McFarland, Shelagh Whitley and Gabrielle Kissinger, “Subsidies to key commodities driving forest loss: implications for private climate finance”, Working Paper (London, United Kingdom, Overseas Development Institute, March 2105).

Note: Annual subsidies to specific agricultural commodities (beef and soy in Brazil; palm oil and timber in Indonesia) compared to annual international REDD+ finance and forestry ODA in Brazil and Indonesia (gross disbursements, all donors, constant prices) for the period 2009–2012 in millions of United States dollars.