



# HIGH-LEVEL POLITICAL FORUM ON SUSTAINABLE DEVELOPMENT

## 2017 HLFP Thematic Review of SDG-9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation<sup>1</sup>

### A global perspective on SDG-9

SDG-9 is built on three pillars, infrastructure, industry and innovation, all of which are strongly connected among themselves and share the common goal of achieving socially inclusive and environmentally sustainable economic development. Over the past decades regions such as East and South Asia have made remarkable progress in achieving development goals in the areas of infrastructure, industrialization and innovation. However, achieving Goal 9 by 2030 will require addressing a range of resource constraints, especially in the context of developing countries vulnerable countries including the least developed countries (LDCs), Landlocked Developing Countries (LLDCs) and Small Island Developing States (SIDS). Countries will have to strengthen their capabilities and explore new ways to solve development challenges by involving various actors, processes and types of governance, source of finance and encourage collaboration and cooperation across stakeholders, sectors and regions.

The industrial sector proves to be particularly challenging in geographical areas such as Sub-Saharan Africa, whose industrialization levels remain low or have stagnated, thus undergoing a much slower pace of progress in poverty eradication. By adopting Goal 9 in particular, the global community addresses these and other challenges by committing itself to an industrial development that is inclusive and sustainable (ISID), thus highlighting close linkages with virtually all other SDGs as regards job creation, sustainable livelihoods, SME development, better health, technology and skills development, food security, green technologies, environmental protection, building resilient cities and climate change mitigation.

There are many different indicators and metrics to evaluate industry, innovation and infrastructure. This paper discusses just a few of them – global manufacturing employment; mobile and Internet penetration, R&D expenditure & staff, and medium- and high-tech value-added in total value-added.

A global perspective on the status of SDG-9 and its related targets indicates that, for example regarding target 9.2<sup>2</sup>, progress in global manufacturing employment over time shows a somewhat mixed trend. Global employment in manufacturing and manufacturing-related services (direct and indirect) has grown from an estimated 262 million in 1970, to 482 million in 2014, an average yearly growth rate of 1.4 per cent. In relative terms, however, manufacturing employment has decreased from 18.7 to 16 per

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<sup>1</sup> This background note has been developed by members of ECESA Plus as a coordinated contribution by the UN system to the 2017 HLPF in depth review of SDG 9. Co-leads ITU, UNCTAD, UNESCO, UNIDO, WIPO and the World Bank and contributions by ECLAC, ESCAP, ESCWA, IFAD, ILO, OHRRLS, RCNYO, UNAIDS, UNCDF, UN ECA, UN Habitat, UN Women.

<sup>2</sup> Target 9.2: promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries



## HIGH-LEVEL POLITICAL FORUM ON SUSTAINABLE DEVELOPMENT

cent between 1970 and 1990, and has remained stable since. A structural shift away from direct employment in manufacturing across developed countries explains the stagnation one observes in the share of manufacturing employment in total global employment. The increase in absolute numbers, on the other hand, is compounded by rapid population growth over the past decades. As such, the evolution of manufacturing employment suggests that a degree of caution may be warranted when identifying the various factors which contribute to progress in achieving Goal 9, and especially target 9.2.

Target 9.3<sup>3</sup> recognizes the importance of access to financial services, including credit for small-scale industrial and other enterprises especially in developing countries. While some 80% of SMEs have access to some account services with formal financial institutions, access to credit remains low with only 37% receiving the credit that they need to compete, grow, and create more formal sector jobs, which pay better and last longer than informal employment. The problem is more severe when microenterprises and the informal sector are taken into account. The overall MSME financing gap, has been estimated by an IFC and McKinsey study to be in excess of \$3 trillion, two thirds of which are in developing economies<sup>4</sup>.

Yet SME finance is associated with a number of benefits that contributes to SDG 9, along with other goals, namely job creation and growth under SDG 8, as well as SDG 5 (if access is also extended to women-owned firms). These include (a) the positive relationship between external finance and the number of start-ups, closely related to entrepreneurship; (b) access to formal financial sources enables investments in capital, new technologies, research and innovations and improved returns; (c) enables liquidity, improves firms' risk management and allows the acquisition of productive assets; (d) access to finance can also have indirect employment effects in the supply chain of firms served<sup>5</sup>. Furthermore, the percent of SMEs with a loan or line of credit is positively correlated with new firm density, and real GDP per capita.<sup>6</sup>

The evolution over the past ten years of the mobile sector globally provides another good example on the current status of one of SDG-9 related targets, in this case target 9.c<sup>7</sup>, as well as its implications to other SDGs. Over the last decade, the mobile sector grew dynamically, with mobile-cellular subscription penetration increasing from 41.7 per cent in 2006 to almost 100 per cent by the end of 2016. Consequently, the spread of Internet access has been largely driven by mobile technologies, considering that around 84 per cent and 53 per cent of the population are now within reach of a 3G and Long-Term Evolution (LTE) mobile-broadband signal, respectively. However, more than half the world's population still remains offline, suggesting that, contrary to expectations based on mobile subscriptions or mobile coverage, a significant digital divide still persists, reflecting problems in supply, effective consumer demand and awareness.

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<sup>3</sup> Target 9.3: increase the access of small-scale industrial and other enterprises, particularly in developing countries, to financial services including affordable credit and their integration into value chains and markets

<sup>4</sup> IFC, Closing the Credit Gap for Formal and Informal Micro, Small, and Medium Enterprises, 2013.

<sup>5</sup> IFC Jobs Study. Also for a country example, see a micro-case study in Sri Lanka (authored by Lueva Urenda, 2012) which shows that business expansion and technology investments were the two main channels of job creation for firms (MSMEs) that obtained loans.

<sup>6</sup> World Development Indicators (latest available), Enterprise Surveys (latest available), Entrepreneurship Database (latest available).

<sup>7</sup> Target 9.c: significantly increase access to ICT and strive to provide universal and affordable access to internet in LDCs by 2020



## HIGH-LEVEL POLITICAL FORUM ON SUSTAINABLE DEVELOPMENT

However, Internet access is still limited and not affordable for most people in LDCs. The digital divide persists between developed and least developed countries, with an estimated 11.1 per cent of households in LDCs having access to the Internet at the end of 2016, in comparison to 83.8% in developed countries. This is also applicable to the differences between larger and smaller enterprises, and between urban and rural areas within countries. This is a critical aspect since access to the Internet by individuals and enterprises, in particular by micro and SMEs in LDCs, can improve access to services and resources that support goals and targets other than 9.c, such as ending poverty (Goal 1.4), ensuring healthy lives (Goal 3), achieving food security and adequate nutrition and shifting to sustainable agriculture (Goal 2.3), women's empowerment (Goal 5.b), innovation (Goal 8.3), financial inclusion (Goal 8.10), integrating value chains (Goal 9.3), and enabling exports (Goal 17.11).

### Goal 9 connectedness with other SDGs

The 2030 Agenda for Sustainable Development is universal and integrated, which means that there are many strong interlinkages among the SDGs. These interrelations are complex. Some goals and targets interact with others more strongly than others. Some targets reinforce each other (synergies). Others may conflict with one another (trade-offs). Some may be necessary for others to be achieved (enablers). A good example of the above is that most, if not all, the SDGs have industry-related targets because of industrialization's association with job creation (SDG-8), sustainable livelihoods (SDG-11), innovation, technology and skills development (SDG-9) or food security (SDG-2). Similarly, the concept of innovation, understood as new forms of social practice and organization, as well as new or improved products and business processes, is not only an explicit focus of Goal 9 but also a key enabler of most, if not all, of the Goals. Moreover, the ambitious nature of the 2030 Agenda requires innovation in the ways in which energy (SDG-7), food (SDG-2), water (SDG-6), housing (SDG-11) and other goods and services are delivered, distributed and consumed.

Poor access to infrastructure – notably for transportation, electricity and energy more generally, ICTs and marketing – remains a major impediment of development, diversification, and value addition in the rural sector, including agriculture and agro-industry, in many parts of the world, notably across sub-Saharan Africa. Goal 9 pillars -Inclusive and sustainable industrialization, access to infrastructure and innovation- have also strong implications for rural poverty (SDG-1), the ability of agriculture and food systems to deliver on food security, nutrition and sustainability objectives (SDG-2), the ability of rural economies and the agri-food sector to provide employment and entrepreneurship opportunities for large and growing cohorts of young entrants into the labour market (SDG-8), and mitigating rural-urban migration pressures and leveraging opportunities linked to urbanization through better rural-urban linkages (SDG-11). Other interlinkages are with SDG 4.a, SDG 5.4, SDG 6.1 and 6.2, and SDG 7.1 and 7.b<sup>8</sup>.

With regard to health (SDG-3), improved access to electricity, transportation and, increasingly, to modern ICT provides substantial health benefits through m-health and e-health, which empower community health workers to deliver better care at lower costs. Equally, poor access to financial services particularly for women and for micro, small and medium-sized rural and agri-food enterprises impedes rural and agri-food investments needed to achieve SDGs 1,2, 5, 8 and others.

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<sup>8</sup> GSDR 2016, The infrastructure – inequality – resilience nexus, page 22. See [https://sustainabledevelopment.un.org/content/documents/10786Chapter2\\_GSDR2016.pdf](https://sustainabledevelopment.un.org/content/documents/10786Chapter2_GSDR2016.pdf)



# HIGH-LEVEL POLITICAL FORUM ON SUSTAINABLE DEVELOPMENT

## Challenging scenarios

One of the conclusions we can extract from the previous sections is that Internet access by micro and SMEs is a tool for "inclusive and sustainable industrial development", for Goal 9 to be successfully implemented these and other realities need to be fully considered. In this connection, in order to measure progress towards target 9.c, the 2030 Development Agenda monitoring framework tracks the indicator, "Percentage of the population covered by a mobile network, broken down by technology".

However, the mobile penetration indicator does not monitor whether individuals are actually using those networks, the affordability aspect, nor the access and use of the Internet by the productive sector. Therefore, the SDG monitoring framework will not produce sufficient knowledge to support the implementation of target 9.c. Apart from the access and affordability, other challenges that limit Internet use in LDCs are low levels of ICT literacy, little local content, and lack of trust.

Interventions aimed at improving the access, affordability, and quality of mobile broadband will be the key to increase Internet use in LDCs. In addition to affordability measures, building the ICT skills of individuals and enterprises, developing relevant Internet content, strengthening regulatory frameworks and promoting trust in the Internet are all important to support implementation, by ensuring that improved access will result in improved use.

Inadequate transport leads to higher trading costs, diminished export competitiveness and reduced attraction for FDI, particularly in LLDCs, where transport infrastructure is inadequate and suffers from missing links. International trade plays a role for LLDCs, yet their share of global exports in 2015 was only 0.96 per cent. Transit cooperation, multimodal transport, development of transport corridors and efficient transit facilities play a critical role in bringing about transformation in these countries.

Regarding target 9.5<sup>9</sup>, trends in research and development (R&D) expenditure show that overall there has been significant growth globally, although much less so in LDCs, which have seen only modest growth since 2000. In 2014, the world's average R&D expenditure as a proportion of GDP stood at 1.7 per cent. However, there are significant disparities between regions when considering their level of development. R&D expenditure was 2.4 per cent of GDP for developed regions, 1.2 per cent for developing regions, and 0.3 per cent for LDCs. Similar disparities also exist when examining the number of researchers per million inhabitants. The global average was 1,098 researchers per million inhabitants in 2014, ranging from 3,739 in developed regions to only 63 researchers per million inhabitants in LDCs in the same year.

In terms of the medium and high-tech industry (MHT) value added in total value added, data from UNIDO<sup>10</sup> show that developed countries report the highest proportion of medium and high-technology value added than other groups of countries, with 40 per cent in 2008, while low income developing countries report 14 percent and middle income countries 26 per cent in 2010. It is important to note, however, that the productive structure of the economy is strongly influenced by the comparative

<sup>9</sup> Target 9.5: Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending

<sup>10</sup> <https://stat.unido.org/content/publications/statistical-indicators-of-inclusive-and-sustainable-industrialization;jsessionid=D4EEDB3D5FABFC1818722F735E76CC61>



## HIGH-LEVEL POLITICAL FORUM ON SUSTAINABLE DEVELOPMENT

advantages of countries. Therefore, although the more advanced economies tend to show higher shares of MHT industry value added in total manufacturing, there is significant variation in the levels in developing countries in this indicator, such as Indonesia (38% in 2010) and Malaysia (42% in 2010). This underlines the limitation of considering indicators in isolation, as opposed to as a part of systemic assessment.

### Financing implementation of SDG-9

Investments in infrastructure and technologies that simultaneously reduce time burdens and drudgery, curb carbon emissions and create jobs are key to meet SDG-9. Investment in water pumps, electricity, clean cook stoves, mini-grids, publicly and collectively owned mills and grinding machinery, and transport all have the potential to support growth that is local and inclusive, and to reduce drudgery, increase the efficiency of care work, reduce time use in caring activities –particularly critical for women, both in rural and in urban areas- and free up time for other activities such as paid work, income generation, political activities, education, leisure and self-care. There are large disparities in access to infrastructure: Worldwide, over 1.1 billion people still have no access to electricity. 663 million people lack access to clean water, and 2.4 billion do not have adequate sanitation. About one third of the world's population is not served by all-weather roads<sup>11</sup>.

Closing those disparities would require large investments: The global infrastructure gap is estimated to amount to \$1-1.5 trillion annually in developing countries. Developing a pipeline of - and putting in place the financing tools to manage and invest in - infrastructure projects that specifically overcome the challenges women face and seek to empower them economically is especially important in this regard, given the high burden of unpaid care work many women carry. It is critical that investments in these areas increase and their impact is adequately tracked.

Many rural and remote areas are cut off from economic opportunities, markets, and public services, which lock residents in low productivity and poverty. Experience from Bangladesh, Cameroon, China, Ethiopia, India, Viet Nam and other countries shows that investment in secondary rural roads tends to have positive effects on the private sector productivity, poverty reduction, school enrolment, access to health services, and economic growth, and comparison studies have found a higher benefit to cost ratio than investment in higher-volume roads. Better rural infrastructure also facilitates women's free movements and can lead to empowerment<sup>12</sup>.

Much of the recent debate and also of some recent international initiatives around enabling policy and financing frameworks for scaled-up investment in infrastructure focus on large-scale infrastructure, with only limited attention going to "last mile" infrastructure requirements, for example reducing rural-urban inequalities in terms of quality and access, and support for local food systems (as opposed to strengthening the infrastructural underpinnings of export-oriented or large urban market-oriented food chains). Particular attention needs to be given to the sequencing of investments in order to make the best possible use of scarce public resources and open new opportunities for private sector participation to fill the gaps. The private sector is called an important contribution to finance infrastructure, including

<sup>11</sup> GSDR 2016, The infrastructure – inequality – resilience nexus, page 22. See [https://sustainabledevelopment.un.org/content/documents/10786Chapter2\\_GSDR2016.pdf](https://sustainabledevelopment.un.org/content/documents/10786Chapter2_GSDR2016.pdf)

<sup>12</sup> GSDR 2016, The infrastructure – inequality – resilience nexus, page 27. See [https://sustainabledevelopment.un.org/content/documents/10786Chapter2\\_GSDR2016.pdf](https://sustainabledevelopment.un.org/content/documents/10786Chapter2_GSDR2016.pdf)



## HIGH-LEVEL POLITICAL FORUM ON SUSTAINABLE DEVELOPMENT

in the framework of well-structured public-private partnerships. Ensuring the protection of public interests while meeting development goals requires careful attention. Efforts in this direction can be supported by the use of appropriate standards.

Taking forward an agenda of investment in rural, including small-scale infrastructure presents problems of high transaction costs (including for project preparation), difficulties in reaching economies of scale, and risks, inter alia. Similar considerations apply to an agenda of large scale penetration of financial services in the agri-food and rural sectors, which in many contexts are largely made up of small-scale operators, posing challenges of fragmentation, lack of credit records, access to collateral, exposure to a variety of types of risk (actual or perceived), and so forth. On a positive note, on the policy side, over the past few years we have seen clear appreciation of the important role of agro-industry in driving job-rich growth in many countries, which has translated into policy commitments and frameworks related to agro-industry development with a focus on boosting agricultural productivity, as well as value addition through agro-processing and improved marketing.

So far, global, regional and voluntary national reviews on SDGs reflect significant gaps in industrial statistics at the national level, particularly in developing countries, partly due to poor policy integration across line ministries which could be highly improved in many cases, particularly to ensure the incorporation of inclusive and sustainable industrialization approaches in the economic development plans of countries, regardless of their income level.

### Partnerships

SDG-9 has served as a boost to implement innovative and creative partnership particularly within entities belonging to the United Nations ecosystem as well as among the Multi-lateral Development Banks (including regional banks).

A good example of the above is UNIDO's new approach, by introducing a new model of multi-stakeholder partnership, called the Programme for Country Partnership (PCP), through which the Organization combines its convening and policy advisory role to design industrialization strategies and instruments complementing its well-established technical assistance role. This model adopts a holistic and inclusive approach by ensuring country ownership and making due alignment to the country development strategies. At the same time, given UNIDO's close links with the private sector and its historic role as a platform for economic cooperation between developing and developed countries, the PCP solicits investments from public and private, international and domestic sources, around a common strategy for inclusive and sustainable industrialization at the country level.

The United Nations Conference on Trade and Development (UNCTAD) is actively supporting improved access to ICT as a tool for sustainable structural transformation, to improve the efficiency of micro and SMEs, and to enable exports. The eTrade-for-All initiative<sup>13</sup> provides a multi-stakeholder platform to leverage e-commerce for development by pooling resources of leading development partners, the private sector, and facilitating access to potential beneficiaries. The Better Than Cash Alliance (BTCA), hosted by UNCDF, is advocating the use of digital payments on the growing evidence base that these are more efficient and less wasteful than bulk cash payments.

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<sup>13</sup> [unctad.org/etrade-for-all](http://unctad.org/etrade-for-all)



## HIGH-LEVEL POLITICAL FORUM ON SUSTAINABLE DEVELOPMENT

The International Telecommunication Union (ITU) contributes to enhancing the global partnership for sustainable development by working with governments, through their policy-making and the development of institutional frameworks for the ICT sector, to lay the foundation for modern digital economies. ITU has introduced its Connect 2020 Agenda and the Broadband Commission for Sustainable Development agreed a set ambitious targets that countries around the world should strive to meet in order to ensure their populations fully participate in tomorrow's emerging knowledge societies, covering broadband policy, affordability, uptake and gender equality.

The G20 launched a Global Infrastructure Connectivity Alliance (GICA) in July 2016, and requested the World Bank to become its Secretariat. GICA aims to enhance cooperation and synergies of existing and future global infrastructure and trade facilitation programs seeking to improve connectivity within, between and among countries. It covers transport, energy, ICT, water and trade. It will support progress towards Target 9.1<sup>14</sup>. The Alliance is expected to produce value by helping countries and promoters of connectivity initiatives to address bottlenecks related to connectivity globally, multi-sectoral and integrative of both the hardware and software of connectivity. This, in turn, will provide impetus to sustainable and equitable growth for concerned countries through increased flow of goods, capital, people and information (virtual connectivity).

The World Intellectual Property Organization (WIPO) undertakes a broad range of activities that contribute to Intellectual Property (IP) protection and innovation, and so to the realization of the SDGs. These include programs to strengthen national policy and legislative frameworks to facilitate innovation, as well as specific activities to promote innovation and strengthen capacities in the field of IP and in thematic areas such as education, health and, environment. In summary, in order to help countries to assess their innovation eco-system, WIPO has developed a tool, the Global Innovation Index (GII), to benchmark countries' innovation performance. The GII ranks the innovation performance of some 140 countries and economies around the world, based on around 80 indicators among which are patent applications. In 2015, innovators lodged close to 3 million patent applications, representing an increase of 7.8% over 2014. Applications in other IP fields (such as trademarks and industrial designs) are also increasing, including in low and middle-income economies.

### Recommendations

Policy-makers must invest significant efforts in ICT connectivity to improve the real-world 'analogue' complements or regulatory frameworks to enable countries to reap the full benefits of the digital revolution. In particular, regulators are encouraged to modernize Universal Service programmes to extend broadband to the un-served and underserved, notably through a redefinition of the scope of universal service. From the demand side, measures such as deferring or altogether discouraging heavy or special taxes on ICT equipment and services, encouraging R&D, enhancing technology security and privacy and endorsing special programmes to stimulate e-literacy, will result in higher penetration, increased demand, better social inclusion and contribute to national economic growth.

To monitor target 9.c, more indicators need to be considered to reflect affordability, the inclusiveness and quality of Internet access, and the level of Internet use, by individuals as well as enterprises.

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<sup>14</sup> Target 9.1: Develop quality, reliable, sustainable and resilient infrastructure, including regional and trans- border infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all



## HIGH-LEVEL POLITICAL FORUM ON SUSTAINABLE DEVELOPMENT

Developing countries currently lack sufficient, good quality data to plan, monitor, and evaluate ICT for SDG policies. To increase the availability and quality of these data, efforts to strengthen the capacity of national statistical systems in producing ICT statistics must be increased.

More action is needed in promoting inclusive and sustainable innovation while discouraging harmful innovation. In addition, continuous efforts should be devoted to strengthening the innovation capabilities of countries and to promote an enabling environment for innovation. The High-Level Political Forum (HLPF) could in this regard encourage countries to recognize, monitor, and share best practices on how ICTs are key enablers of many of the SDGs, including but not restricted, to SDG-9.

There is also a need, especially in LDCs, for more innovative financing approaches and models that use public resources (such as ODA) to de-risk and mobilize additional resources – from multiples sources – and channel them beyond capital cities and narrow infrastructure corridors and into local economies to finance SMEs and build resilient infrastructure.

It is also especially important to develop those financing models and instruments that can empower women economically, though supporting women entrepreneurs and business owners and through building the infrastructure that can empower women. Indeed, increased investments in local infrastructure and entrepreneurship can make a direct and lasting difference in the lives of women by reducing women's burden of unpaid care work and providing women with better access to markets and resources.

Further, more efforts are needed to promote collaboration among stakeholders, especially those aimed at increasing private R&D efforts. Particular emphasis is required in facilitating the absorption of foreign technologies and the dissemination of innovation across the economy, reducing technological gaps. But it is also important that the concept of innovation extends beyond technological innovation and policy is also focussed fostering other forms of innovation related to improved processed and organizational practices.

In light of the complexities associated to inclusive and sustainable industrialization, particularly in the context of a globalized world, technological developments are expected to drive a major revolution in the way goods are produced, distributed and disposed of– including digital goods, globalized supply chains, access to new markets etc. The HLPF may consider raising awareness on the need for increased international industrial cooperation in the field of science, technology and innovation, also catalyzing the efforts made by UN entities and international finance institutions, to raise public and private resources to achieve industry-related SDGs, in particular Goal 9, as well as the Third Industrial Development Decade for Africa. This could be achieved by supporting the facilitation of international and multi-stakeholder platforms on these issues.

National governments can ensure infrastructure investments are based on analysis of the diverse needs, constraints and opportunities of the women and men in their care and productive roles (as farmers, entrepreneurs, etc.). Infrastructure investment in priority sectors -energy, water and sanitation, agriculture and agro-industry, transport, affordable serviced land and housing, and information and communication technologies (ICTs) – can expand market activity and enable access to new markets and new job opportunities for women and youth in formal and informal sectors.





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## HIGH-LEVEL POLITICAL FORUM ON SUSTAINABLE DEVELOPMENT

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Enhanced support is needed for the vulnerable countries - the LDCs, LLDCs, and SIDS - for policy development, accessing finance, new technologies, innovation, and capacity building for development of resilient infrastructure.