1) Main policy issues, potential goals and targets (aligned with issue brief)

The pivotal importance of Science, Technology and Innovation (STI), Knowledge-sharing and Capacity building for eradicating poverty and achieving sustainable development has recently been confirmed at the Rio+20 Conference and the 2013 ECOSOC Annual Ministerial Review. While research and innovation become increasingly open, collaborative and international, access to the benefits of STI and knowledge is unequally distributed within and among countries and people, and the technological gap between developing and developed countries is persistent. Access to new technologies, in particular information and communication technologies (ICTs) is recognized as a priority for the post-2015 agenda. Building an inclusive information society and providing affordable access to knowledge and information for all has been a goal called for at a number of recent high-level events.

The benefit of a stand-alone SDG on ‘Harnessing STI for Sustainable Development’ is that it would enhance the adoption and operationalization of integrated national STI strategies and action plans for sustainable development and would increase innovation capacities, green technology transfer and scientific capacity-building in developing countries.

The following potential targets are identified in the issues brief:

- Investment in science, technology and innovation, including investment in R&D, as a percentage of GDP and as a percentage of Official Development Assistance;
- STI policies as holistic frameworks and integral part of national sustainable development policies addressing inter alia the following:
  - Increased multi-stakeholder collaboration across the policy-science-industry-society spectrum;
  - Human, institutional and societal STI capacity-building, with a strong focus on training and science education at all levels;
  - Measurement of innovation capacity across a range of metrics which combine to create national innovation eco-systems;
  - Achieving gender parity in STI systems;
- Level of openness achieved in accessing, sharing, processing and using scientific research and knowledge;
- Inclusive Internet connectivity and use; scaling up of ICTs to spur local innovation;
- Data revolution including solid STI statistics and indicators systems, and adequate capacities for data collection and analysis;
- Regional and international STI cooperation and multi-stakeholder partnerships, in particular South-South and North-South-South;
- New and stronger financing mechanisms at all levels for STI, knowledge and data-sharing, capacity development and green technology transfer;
- Achieving specific resource efficiency/decoupling factors via STI.
2) Conceptual and methodological tools (references)

Measuring Research and Development (R&D)
The Frascati Manual¹, developed by the OECD, has become the global standard for collecting R&D statistics. The UNESCO Institute for Statistics (UIS) recently contributed a supporting document² to help developing countries apply the Frascati Manual to their particular context. The Frascati Manual is currently being revised by the OECD, taking into account its use as the global reference manual.

The System of National Accounts 2008 (2008 SNA) recognises the expenditure on R&D as capital formation. Guidance for R&D in the 2008 SNA as intellectual property product is provided by the OECD Handbook on Deriving Capital Measures of Intellectual Property Products³ using the Frascati based surveys as source data.

Measuring Innovation
The ability to determine the scale of innovation activities, the characteristics of innovation firms and the internal and systemic factors that can influence innovation is a prerequisite for the pursuit and analysis of policies aimed at fostering innovation. The OECD/Eurostat Oslo Manual⁴ is the foremost international source of guidelines for the collection and use of data on innovation activities in industry. Also, the Global Innovation Index (GII) co-published by Cornell University, INSEAD, and the World Intellectual Property Organization (WIPO) has evolved to an important benchmarking tool to measure innovation in a more holistic fashion.⁵

Measuring the information society
The OECD Guide to Measuring the Information Society⁶ provides the statistical definitions, classifications and methods to measure and compare the information society across countries.

The publication Measuring the WSIS Targets: a statistical framework, 2011⁷, by the Partnership on Measuring ICT for Development is a response to the call at the 2011 World Summit on Information Society to develop indicators and produce official statistics for measuring the information society. It provides a concrete list of indicators to monitor the 10 WSIS targets, which range from connecting villages, schools, and health centers to developing online content and providing people with ICT access, and is a practical tool for policy makers and data producers in developing countries to monitor and assess information society developments.

The ITU Handbook for the Collection of Administrative Data on Telecommunications/ICT⁸ (2011) is a key reference document for the collection of internationally comparable indicators on telecommunications/ICT based on administrative sources (i.e. supply-side data mainly

---

from operators). The Handbook includes definitions and methodological clarifications for 81 internationally agreed indicators and corresponding sub-indicators.

The *ITU Manual for Measuring ICT Access and Use by Households and Individuals*\(^9\) has been prepared to support countries in their efforts to measure and monitor the developments towards becoming information societies. It aims at improving the availability and comparability of statistics on access to, and use of ICTs by households and individuals.


The *Partnership on Measuring ICT for Development (2010) Core ICT Indicators* has served as the basis for the collection of internationally comparable ICT statistics worldwide. A revised and extended core list of ICT indicators\(^11\), which includes 7 new indicators on measuring e-government, was endorsed by the UN Statistical Commission in March 2012, at its forty-third session. These indicators are clearly defined and associated with statistical standards, which allows comparability across countries. They cover the areas of ICT infrastructure and access; access to, and use of, ICT by households and individuals; use of ICT by businesses; the ICT sector; trade in ICT goods; ICT in education; and e-government.

**Measuring Patents**

Patent data are an outstanding resource for the study of technical change. Alongside other science and technology indicators such as R&D expenditure and personnel or innovation-survey data, patent data provide a uniquely detailed source of information on inventive activity and the multiple dimensions of the inventive process (e.g. geographical location, technical and institutional origin, individuals and networks). The 2009 edition of the *OECD Patent Statistics Manual*\(^12\) takes stock of the recent developments in the field. The World Intellectual Property Organization publishes the *World Intellectual Property Indicators Report* on a yearly basis, and the *World Intellectual Property Report* on a bi-annual basis\(^13\).

3) **Relevant MDG indicators or other international indicators and need for new indicators**

In the current MDG framework, the following target and three indicators are being tracked under Goal 8 (Global Partnership for Development):

| **Target 8.F:** | 8.14 Fixed telephone lines per 100 inhabitants  
8.15 Mobile cellular subscriptions per 100 inhabitants  
8.16 Internet users per 100 inhabitants |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>In cooperation with the private sector, make available the benefits of new technologies, especially information and communications</td>
<td></td>
</tr>
</tbody>
</table>

---


ITU maintains a large number of indicators in its World Telecommunication/ICT Indicators database. The ICT sector is very dynamic and technological and market developments in telecommunication and ICT services have undergone a major transformation over the last few years. These rapid changes, as well as the strong growth in ICT access and use, make a review of the existing indicators necessary. In particular, the importance of the fixed-telephone network has decreased, and there is a growing trend toward broadband, including mobile-broadband infrastructure and services. In addition, over the last years, an increasing number of countries have expanded the number and type of indicators that can help monitor ICT access and use. A revised list of indicators to track post 2015 developments worldwide would have to take these changes into account.

In the current MDG framework, there is no goal or indicator for science. There is a need though to recognise science in its own right as an important tool for development.

4) Data availability and data sources (National and International), and Data gaps with feasibility and resource requirements to fill those gaps

OECD maintains databases with a large number of indicators on R&D, science and technology, innovation, patents and bio-technology, but these indicators are almost only collected for the OECD Member States.

UIS maintains a global database, which contains data for R&D expenditure as a % of GDP for about 130 out of 215 countries and territories. For the number of researchers, there are data for about 140 countries when measured in head count and for 115 countries when measured in FTEs. For about 130 countries, a gender breakdown is available. Comparability of the data within the group of OECD and Eurostat countries is very good, whereas for the other countries it varies. Capacity building will be crucial to raise the quality and quantity of data for developing countries.

There are almost 100 countries that have carried out at least one innovation survey in the business sector of their country according to the OECD/Eurostat Oslo Manual. Innovation statistics are collected by countries, which submit the data to various regional and international organisations, including the OECD, Eurostat, AU/NEPAD and the UNESCO Institute for Statistics (UIS), which is attempting to develop an international database. The international comparability of innovation data is rather limited, particularly outside Europe, and significantly lower than for the R&D data. Capacity building will be even more important than for R&D data to raise the quality and quantity of data for developing countries.

Data to track the three proposed ICT targets are based on both administrative records and national household surveys. Data based on administrative records are widely available (for more than 150 countries). Data for the indicators on ICT prices (Target 1) are collected

---

15 See [http://www.oecd.org/sti/rds](http://www.oecd.org/sti/rds)
16 See [http://www.oecd.org/sti/msti.htm](http://www.oecd.org/sti/msti.htm)
19 See [http://www.oecd.org/innovation/inno/keybiotechnologyindicators.htm](http://www.oecd.org/innovation/inno/keybiotechnologyindicators.htm)
20 See [http://www.uis.unesco.org/DataCentre/Pages/BrowseScience.aspx](http://www.uis.unesco.org/DataCentre/Pages/BrowseScience.aspx)
annually, through a questionnaire that is sent to official government agencies in charge of ICT statistics. For those countries that do not reply, data are collected directly from operators’ websites. Data to track ICT use (Target 3) are based on household survey data and while the data gaps are more important than for the other indicators, data availability is increasing on a continuous basis.

ITU’s World Telecommunication/ICT Indicators database on CD-ROM and online contains time series data for the years 1960, 1965, 1970 and annually from 1975 to 2012 for more than 150 telecommunication/ICT statistics covering fixed telephone network, mobile-cellular telephone subscriptions, quality of service, Internet (including fixed- and mobile-broadband subscription data), traffic, staff, prices, revenue, investment and statistics on ICT access and use by households and individuals. Selected demographic, macroeconomic and broadcasting statistics are also included. Data for over 200 economies are available. Notes explaining data exceptions are also included.

The 5th edition of the ITU Measuring the Information Society\(^{21}\) report was launched on 7 October 2013. It features key ICT data and benchmarking tools to measure the information society, including the ICT Development Index (IDI). The IDI captures the level of ICT developments in 157 economies worldwide and compares progress made during the last year. The report also presents the first comprehensive mobile-broadband price data set for almost 130 economies. It features a new model and data to measure the world’s digital native population - those young people who were born into the digital age - and a quantitative overview of digital TV broadcasting trends.

WIPO maintains the database behind the Global Innovation Index for 142 countries. In addition, WIPO maintains the WIPO Statistics database which includes country profiles and intellectual property indicators for the majority of UN Member States.

5) Conclusions

If there will be an overarching explicit STI goal proposed for the post-2015 development agenda, this will require a widely expanded data foundation upon which to monitor progress. It is important to build on existing international standards, such as the Frascati and Oslo Manual and WIPO’s measurement approaches with respect to intellectual property. Whereas a multitude of data and indicators exist for the developed countries, there are still many gaps in the availability of data for developing countries. Further support for statistical capacity building will be needed to meet this demand.

The picture for availability of indicators on ICT is brighter. Major changes have taken place in terms of ICT since 2000. The access to and use of ICT have grown substantially and ICTs have been recognized as an important development enabler. At the same time, internationally comparable data to track the information society has greatly improved and more data are available to track ICT use, its affordability and also its quality. The Partnership on Measuring ICT for Development and the Broadband Commission for Development have identified a number of ICT targets and indicators to monitor the information society and they have improved the availability of comparable ICT indicators.