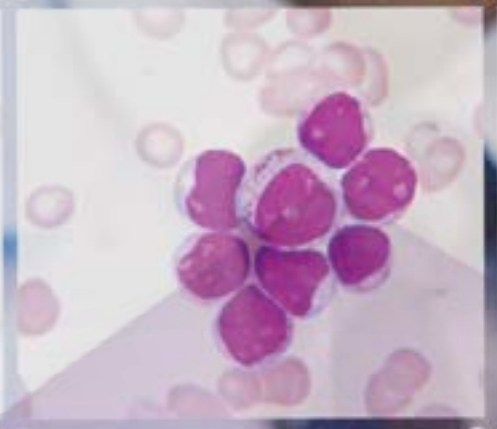
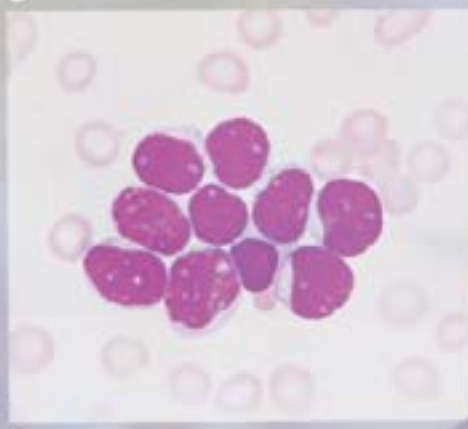




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# ADVANCING CONFORMITY ASSESSMENT FOR THE NEW DIGITAL AGE

## THE NEW DIGITAL AGE

Today, we are at the early stages of the Fourth Industrial Revolution (4IR), which brings physical and biological systems into the digital realm. From artificial intelligence to mobile supercomputing, we are at the start of a new digital age that is transforming every part of our lives. Quality Infrastructure (QI) is no exception.

QI is the combination of initiatives, institutions, organizations, activities and people that help ensure products and services meet the requirements of customers. Conformity Assessment Bodies (CABs) are at the heart of this important work, as the link between regulators, industry and markets.

### What are CABs?

The term Conformity Assessment Bodies (CABs) includes and refers to:



**TESTING LABORATORIES**



**INSPECTION BODIES**



**CERTIFICATION BODIES** – for people, products, processes, services and management systems



**VALIDATION AND VERIFICATION BODIES**  
– confirming accurate information

But the 4IR – and this new digital age – poses a series of challenges for CABs. First, how to operate in a world where products are increasingly digital – either in part or fully. And second, how to embrace digital technology in their own work, such as drones for inspection, machine learning, smart sensors, ICT-based remote auditing, and much more. And finally, how to meet the ever-increasing demand from global consumers for quality and safety.

This is where UNIDO is playing an important role, advancing the future of Conformity Assessment by helping CABs deliver this vital mission in this new digital age.





## TOWARDS SUSTAINABLE DEVELOPMENT

CABs can also play a vital role in Sustainable Development. A notable aspect of this new digital age has been the continued decoupling of economic growth from the consumption of resources. CABs can help move us towards a more circular economy, by driving more sustainable production and responsible consumption. Ultimately, these are the kinds of new pathways we need to take to achieve the Sustainable Development Goals (SDGs), which sit at the heart of the 2030 Agenda for Sustainable Development.

The demands of this new digital age are a particular challenge in developing countries, where systems and laboratories are not always available, or as effective as they could be.

Administrative shortcomings can include outdated institutional frameworks, inadequate coordination of laboratories, poor information sharing and unnecessary duplication of efforts. Ultimately, this can lead to valuable resources being wasted.

There can be numerous infrastructure challenges too. CABs in developing countries can struggle to fulfil their mandated services – such as testing, inspections and certifications – due to a lack of equipment, facilities, and laboratory staff with the right knowledge or training.

For private sector companies, it can be hard to find Conformity Assessment providers that are both demonstrably competent and recognized in destination markets.





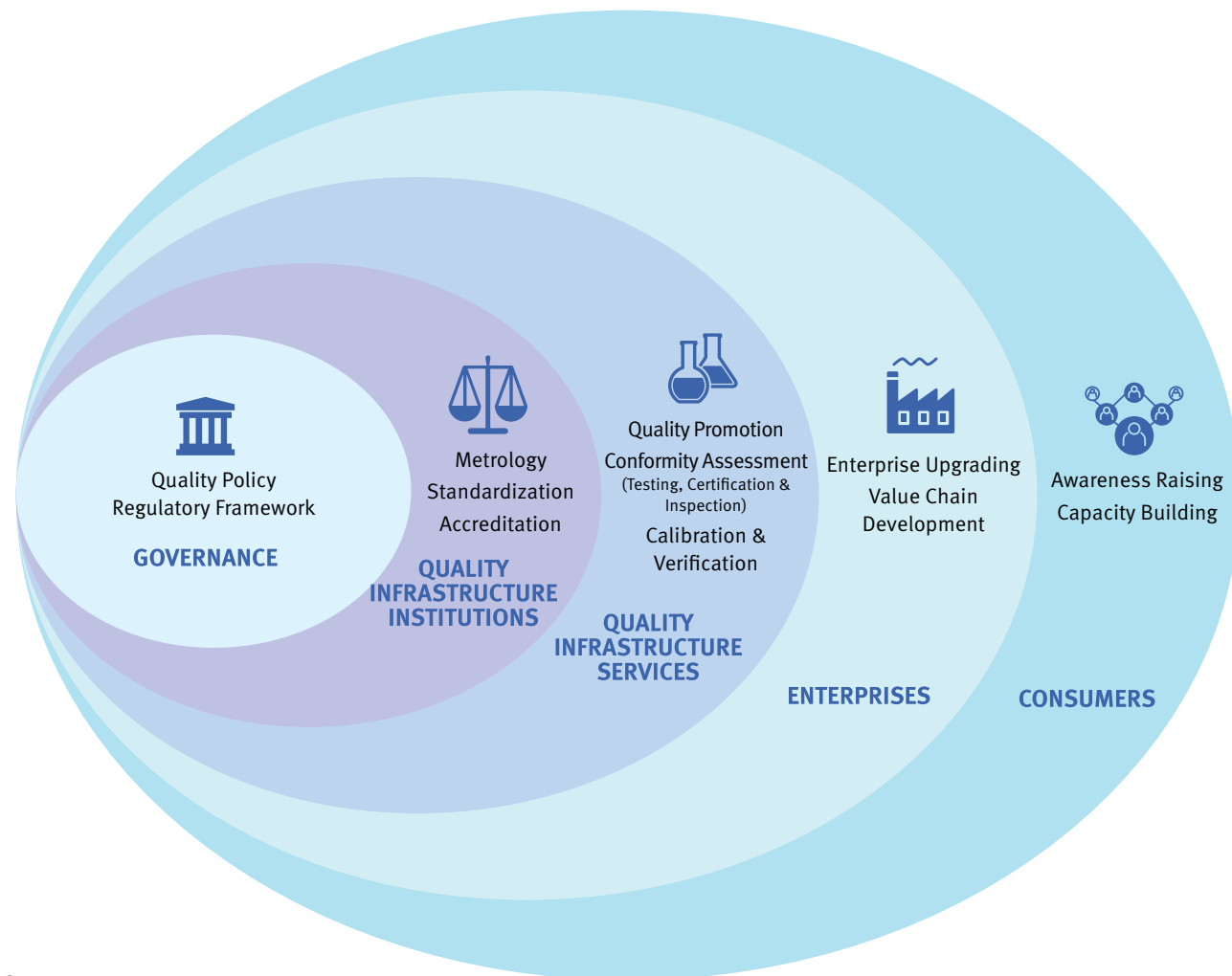
## UNIDO: A TRUSTED PARTNER

Developing countries are striving to enhance their export competitiveness, strengthen their export base and become more integrated with international trade flows. To achieve this, convenient and cost-effective Conformity Assessment services are vital.

As the largest multilateral player in QI development, with a proven track record of enhancing national capacity, UNIDO is the preferred partner of many developed countries (as donors) and developing countries (as recipients of international technical assistance). Policymakers and practitioners turn to UNIDO for their transformative and tailored solutions, from specialised training to the transfer of technical knowledge.



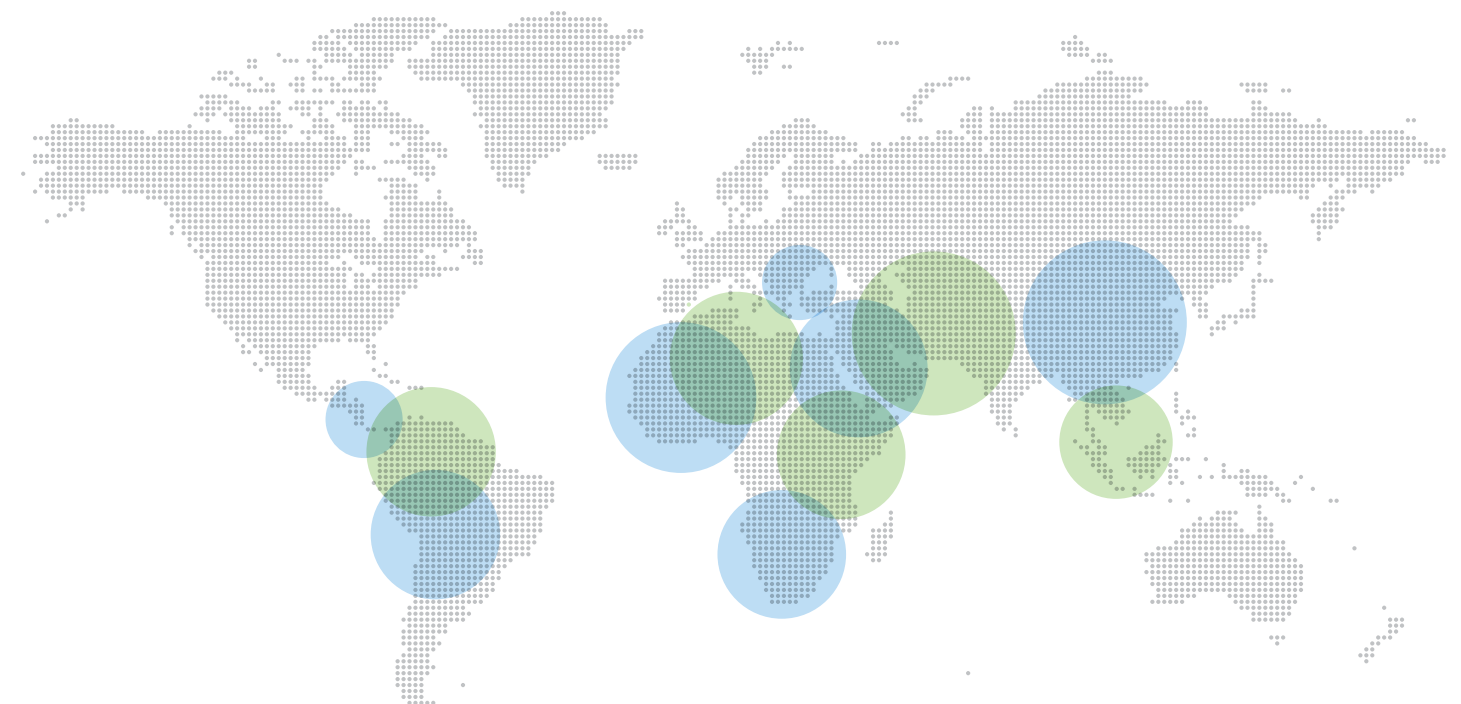
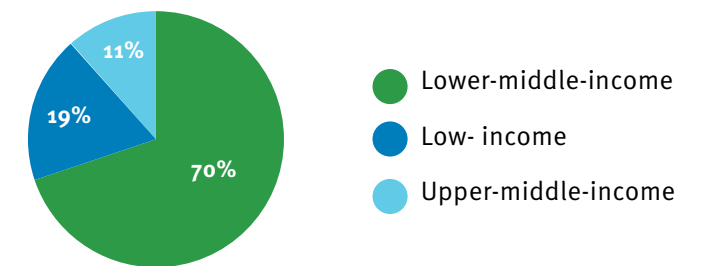
## QUALITY INFRASTRUCTURE SYSTEM



## WHERE WE WORK

Over the last twenty years, UNIDO has supported more than 1,000 CABs in 58 countries in regions across the world, helping numerous developing countries increase their productive capacity, export base and domestic and foreign investment. UNIDO has supported 565 CABs in Asia (55%), and 427 in Africa (41%). 70% of the total CABs supported are in lower-middle-income countries (such as Pakistan, Myanmar, Ghana); 19% in low-income countries (such as Malawi, Mozambique, Nepal); and 11% in upper-middle-income countries (such as Namibia, Colombia and Thailand).

### ECONOMIC STATUS OF CABs SUPPORTED







## CASE STUDY: Technical Assistance in Nigeria

In 2015, UNIDO supported the establishment of the Nigeria National Accreditation Service (NiNAS) within the framework of the EU-funded National Quality Infrastructure Project for Nigeria (NQIP). Through NiNAS, UNIDO was able to help reduce technical barriers to trade in Nigeria, by helping improve compliance with international market requirements for products and services. Today, as Nigeria's recognized national accreditation body, NiNAS delivers a wide range of accreditation services to CABs, as well as training in ISO and other relevant standards. NiNAS's accredited Conformity Assessment services are now widely accepted internationally. As a result, locally NiNAS is now more accessible and cost-effective than overseas accreditation bodies, giving Nigeria a competitive advantage regionally, while also improving the services for numerous enterprises across West Africa.



## WHAT WE DO: OUR UNIQUE TOOLS

UNIDO has developed many complementary tools to help fulfil the demand for quality services in developing countries. These tools help quality infrastructure practitioners and policymakers develop robust, holistic, and demand-driven quality infrastructure systems.

Many of these tools are guidance documents that help developing countries to strengthen their capacities in the area of quality infrastructure and conformity assessment. UNIDO's tools are available on its Trade, Investment and Innovation Knowledge Hub, an interactive online platform that serves to create, share and exchange knowledge.

Some of the guidance UNIDO has developed includes:

- » **Quality Policy Guidance:** Developed together with partners in the International Network on Quality Infrastructure (INetQI), and built on the experience of designing some 26 national and regional policies for developing countries and countries in transition.
- » **Laboratories Policy Guidance:** Helps countries develop a Laboratories Policy (LP) so they can establish a fit-for-purpose, efficient and effective laboratory capability

- based on UNIDO's long record in QI and laboratory capacity building.

- » **Building Trust – the Conformity Assessment Toolbox:** Developed jointly with ISO, this comprehensive and user-friendly handbook covers all aspects of conformity assessment and its role in international trade.
- » **ISO/IEC 17025:2017 Guidance:** This practical guide helps with the first-time implementation and transition to the new version of the ISO/IEC 17025:2017 for testing and calibration bodies. It enables laboratories to demonstrate they operate competently and generate valid results, helping promote confidence in their work both nationally and around the world.
- » **Establishing Accreditation Bodies Guidance:** Developed jointly with the International Accreditation Forum (IAF) and the International Laboratory Accreditation Cooperation (ILAC), this guide helps with setting up Accreditation Bodies in Developing Countries.
- » **ISO 9001 Quality Management Systems Guidance - UNIDO's Good Practices:** Experience in the Market Surveillance of ISO 9001 Quality Management Systems publication presents lessons learned and good practices

in applying Market Surveillance methodology to monitor the effectiveness of ISO 9001 certification in manufacturing enterprises and evaluate the performance of respective certification and accreditation bodies.

In addition to guidance documents, other tools include:

- » **Rejection Analysis Tool:** Border rejections can illustrate some of the compliance challenges of certain products and countries. UNIDO's unique Rejection Analysis Tool provides information on reasons for border rejections in major import markets (including the EU, USA, Australia, Canada and Japan). This allows exporting nations to identify and address compliance bottlenecks of specific product groups.
- » **The Laboratory Network (LabNet):** This web-based portal brings together conformity assessment service providers and enterprises looking to prove that their products are fit-for-purpose.
- » **Trade, Investment and Innovation Training Academy:** This provides interactive training on topics in the field of trade, investment and innovation, such as Quality Infrastructure and Trade, Quality Policy, E-commerce, Industry 4.0, Impact Investment, and many more.

All our tools are available on the Trade, Investment and Innovation Knowledge Hub: [tii.unido.org](http://tii.unido.org)





## CASE STUDY: Strengthening CABs in Southern Africa

To help Southern African nations meet the increasing demand for better and safer products, UNIDO collaborated with the Southern African Development Community (SADC) Regional Laboratory Association (SRLA). Together, they developed a Laboratory Assessment Tool to identify the technical gaps of testing laboratories in the region. Moreover, the tool measures the readiness to implement a quality management system of testing laboratories (i.e. ISO/IEC 17025) and has the ability to measure progressively, over time, the efforts of the laboratory towards meeting the requirements of this standard. In this way, laboratories in the SADC region can be strengthened, and offer high quality and reliable testing services for enterprises and regulators to facilitate trade.



## SETTING THE SCENE: LABORATORY POLICY

UNIDO's Laboratory Policy Development Toolkit has the potential to be applied in any country that wishes to develop its own national laboratories policy. The toolkit works across three core areas: inside the laboratories; on their connection with the market; and finally, at the regulatory and institutional level.

### STRENGTHENING THE LABORATORY



- » Training and developing staff
- » Making sure labs have the right equipment and infrastructure
- » Ensuring demonstrated technical capacities, including risk management

### CONNECTING WITH THE MARKET



- » Building and promoting the laboratory services market
- » Ensuring sufficient coverage of lab services
- » Promoting greater networking

### ENHANCING THE INSTITUTIONAL AND REGULATORY ENVIRONMENT



- » Identifying and addressing regulatory challenges to labs
- » Enhancing cooperation between national bodies
- » Helping labs overcome weaknesses in technical regulation





## CASE STUDY: Support at the policy level in Colombia

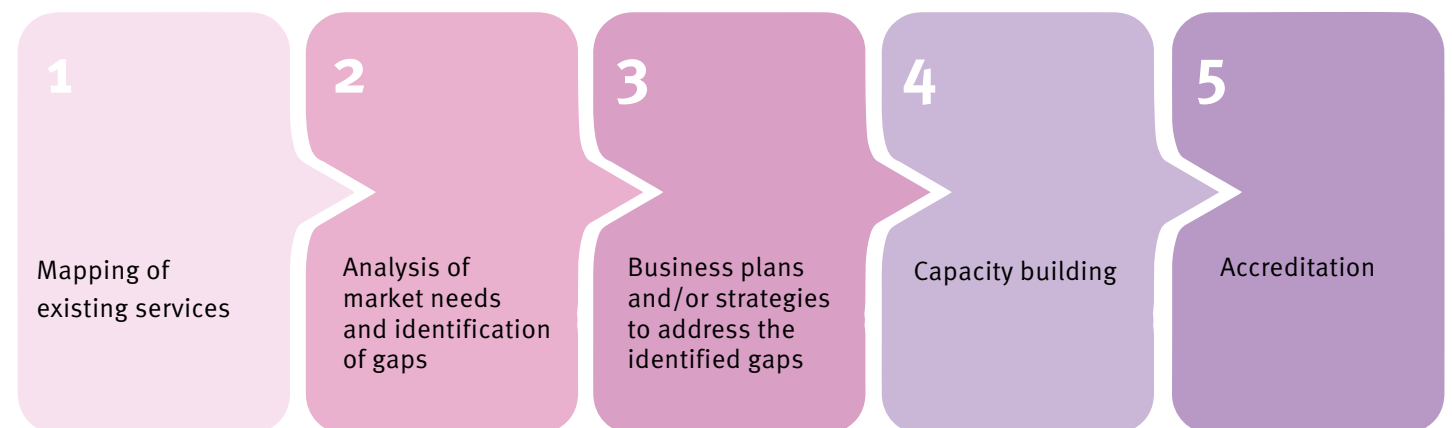
A good example of UNIDO's work across these three core areas is in Colombia, where the SECO-funded Cosmetics Sector Quality Programme, Safe+, provided technical assistance to the country's cosmetic sector. Safe+ supported the national entities to draft the CONPES 3957 National Laboratories' Policy. UNIDO's support involved not only providing expert validation and policy inputs, but also initiating Colombia's Global Quality and Standards Programme (GQSP). The objective of the GQSP is to help SMEs access new markets, by strengthening their quality and standards compliance capacity. It is a clear example of how making full use of UNIDO's work to create an overarching policy framework can help across the board, including guaranteeing consumer rights, safeguarding public health, environmental protection, boosting the competitiveness of national producers and increasing international market access.



## HOW WE WORK: A TAILORED APPROACH

UNIDO owes its status as a preferred partner not just to its powerful toolkit – UNIDO is equally trusted for its ability to deliver tailored solutions. Its demand-driven approach to strengthening CABs follows five steps:

Partners value UNIDO's ability to adapt to ever-evolving requirements. Moreover, they recognise UNIDO's unique capacity to equip countries with the instruments they need and the best way to maximise their benefits.

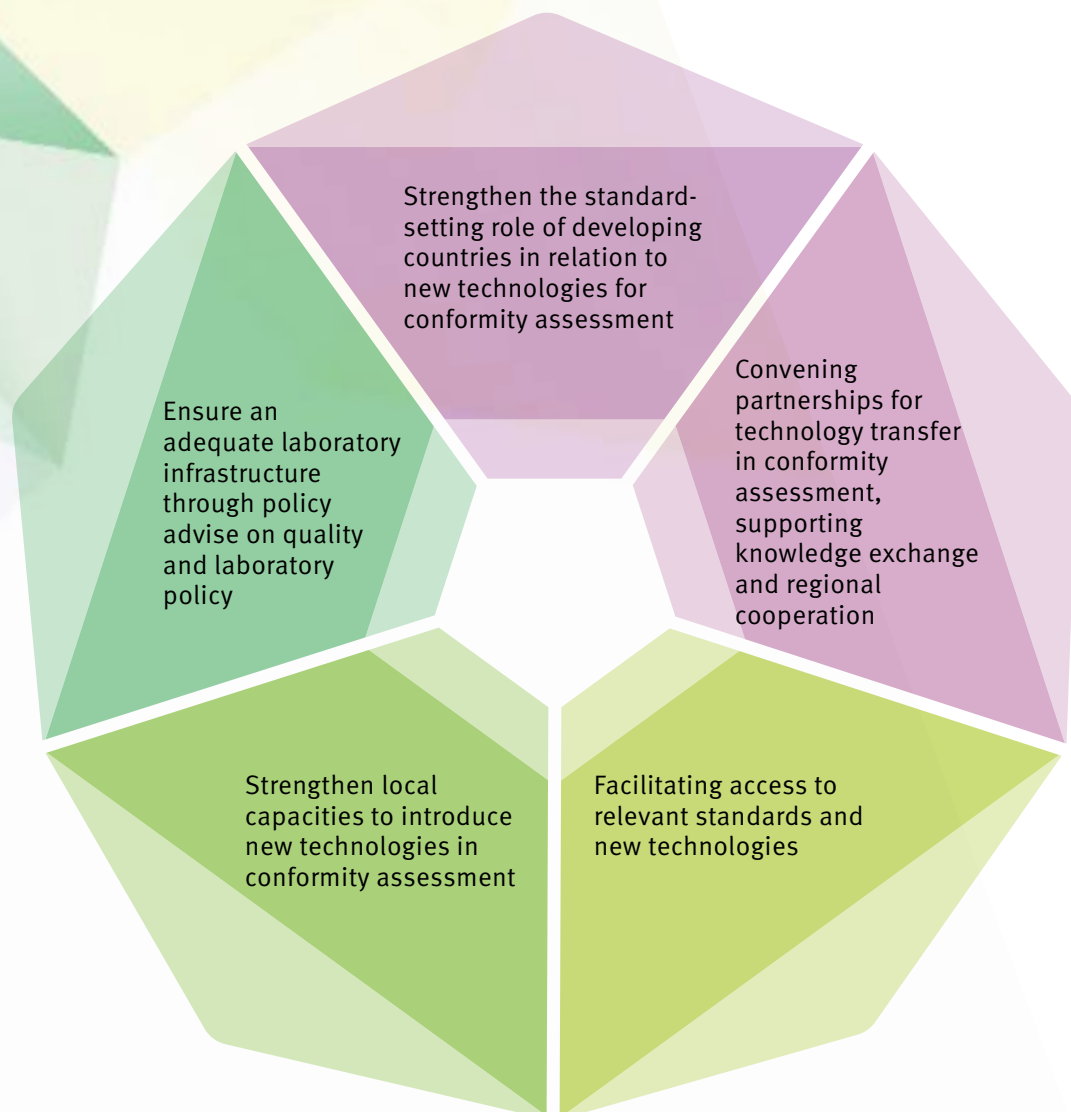
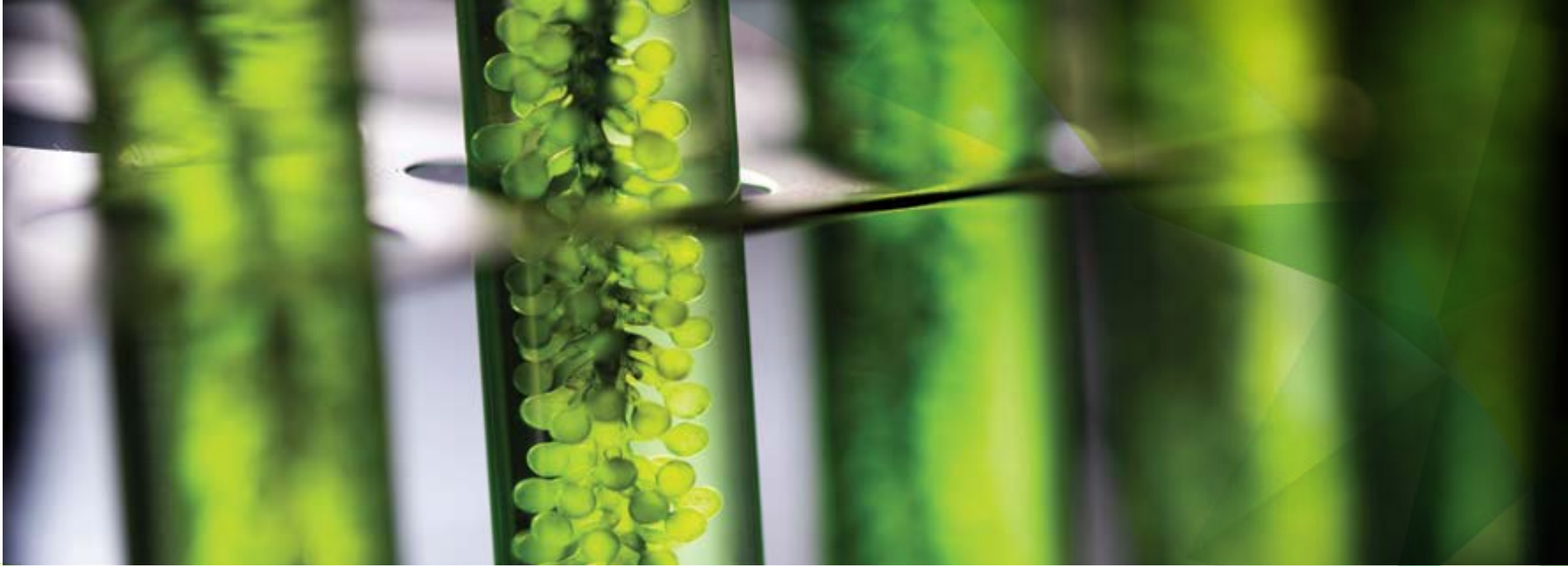






## HELPING COUNTRIES NAVIGATE CHANGE

An important aspiration for developing countries in the field of Conformity Assessment is not simply to cope with change, but to become leaders and technological innovators in their own right. UNIDO's role as a convener of partnerships can be crucial in this respect, by allowing for the proper exchange of knowledge and experience. Ultimately, this means it will become easier to adapt technologies to the needs of the market, and pilot new technology further down the line.



## INTRODUCING NEW TECHNOLOGIES

A central characteristic of the 4IR is the ever-increasing connection between people, technology and industry. This is having a far-reaching impact on the future of Conformity Assessment – and UNIDO's ongoing work. Some of these concepts and technologies include:

- » **Smart Laboratories:** Where automation and informatics can come together to drive change. Examples of the kinds of technologies in Smart Laboratories include:
  - » **AI and machine learning**, such as using digital images in a semi-automated process to reduce mistakes and take away the uncertainty of conformity assessments in industrial testing.
  - » **Big Data**, to help the management and analysis of the increasing quantities and types of data available for testing and inspecting products.
  - » **Cloud computing**, to share data instantly, report issuing and automate certification. This has already been developed in some CABs, resulting in greater insight for customers and their supply chains.
- » **Blockchain Technology:** This offers a new means of transparent, secure and decentralized verification of certificates – especially as they are becoming increasingly digital. This is particularly important for data safety and reliability of services in e-commerce. UNIDO has identified blockchain technology – currently being piloted in Ghana – as a way to improve traceability, transparency and trade

potential in the cocoa value chain. The technology has the potential to increase efficiency and reduce costs by providing accurate and complete data in real-time, to support domestic and international markets. UNIDO is consulting at the regional level to see how these new technologies might serve the whole region.

- » **Metrology 4.0:** The term used to describe existing innovations in non-contact metrology, such as applying smart measuring sensors, 3D scanning, and mobile-tools for real-time calibration and measurement.
- » **Drones:** Drones offer new ways of conducting remote inspections and aerial mapping. They can be equipped with multispectral sensors for precise measurements in agriculture, or thermal cameras for measuring heat distribution.
- » **Sensors:** Sensors will also play an increasingly important role in process control and automated production lines. This can bring greater opportunities for connectivity, data sharing and integration with logistics, providing valuable data and feedback from markets.
- » **Real-time information:** Management systems can be improved by remote access to information in real-time. When brought together with the analysis of big data, remote working, it can promote more efficient ways of auditing conformity to management system standards such as ISO 9001 (Quality), ISO 14001 (Environmental) and ISO 50001 (Energy).





## SHAPING THE FUTURE

It has been shown that establishing a QI can substantially assist a nation in pursuing a development path aligned with the SDGs, overcoming the challenges involved, and benefitting from the considerable opportunities generated through the achievement of the SDGs and the 2030 Agenda.

As a leader in the field of QI, UNIDO will have a large role to play in shaping the future of Conformity Assessment. By aligning its approach for quality infrastructure development and technical support to the demands of the digital era, it can ensure its contributions remain relevant, timely and sustainable.

UNIDO's activities will continue to stimulate knowledge transfer – particularly for CABs in developing countries – to ensure that no country is left behind. With such a pivotal role in helping achieve the 2030 Agenda, every step that we take from now on will directly impact our people and our planet.









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