



Using Quality Infrastructures to Cope with the Economic Impacts of the Pandemic

Discussion Paper

On behalf of



On behalf of the Federal Government of Germany, the Physikalisch-Technische Bundesanstalt promotes the improvement of the framework conditions for economic, social and environmentally friendly action and thus supports the development of quality infrastructure.



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Background

The ongoing Covid-19 pandemic represents a turning point for the global economy. It has led to several recessions and has affected international trade. Whereas industrialised countries have been employing considerable financial means to try to minimise the damage done to their economies, the countries of the Global South do not have these means at their disposal – at least not to such an extent. For the national economies of these countries, it has therefore become all the more important to focus on sustainable economic development.

Besides financial support, there are many sustainable technical possibilities available to support the economy throughout this crisis. These possibilities include quality infrastructure related measures that would help businesses and other economic stakeholders to assure the quality of products and processes, thus becoming more competitive. As a result of the ongoing global Covid-19 pandemic, the concept of **quality** has become increasingly related to health, hygiene, safety, resilience, and sustainability.

Quality infrastructure is a core element in the development of a national economy. It describes a system consisting of public and private institutions, as well as legal and regulatory framework conditions and practices. A quality infrastructure consists of standardisation, conformity assessment (i.e. testing, inspection, and certification), metrology, and accreditation. An operational and needs-oriented quality infrastructure is indispensable to international trade, rural development, economic, ecological, and social standards, as well as innovation, and it ensures the sustainability and resilience of businesses and value chains. The quality infrastructures of individual countries and their institutions must react quickly to the challenges they face due to the Covid-19 pandemic. They must adapt and innovate if they want to be able to provide new services in the future with the same quality as in the past.



This discussion paper aims to offer suggestions and recommendations on how to provide even more specific support to quality infrastructures in partner countries during a pandemic for them to be able to supply innovative services and to contribute to ensuring sustainable economic development. Intervention areas for quality infrastructure will, therefore, be discussed in this paper. In Annex I, we will suggest measures that can be promoted and implemented by the Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung (the Federal Ministry for Economic Cooperation and Development), its implementing agencies (such as the Physikalisch-Technische Bundesanstalt), as well as by the stakeholders of quality infrastructures in countries of the Global South. The aim is to alleviate the impact of the crisis and to sustainably strengthen economies in partner countries. In this context, the authors recommend that the concept of **Build Back Better** should be considered for the global economic system given its present weaknesses to sustainably change for the better.

Section 1 will identify the quality infrastructure options available to global supply chains in the context of the Covid-19 pandemic. Due to the increasing complexity of production processes, businesses depend heavily on global supply chains and are directly concerned by supply bottlenecks caused by the pandemic. A quality infrastructure offers potential solutions in the field of risk management that may provide answers to these challenges.

Primary production faces similar challenges, since smallholder structures are of systemic importance for food security in countries of the Global South. Due to the Covid-19 pandemic, the required supply of seeds, fertilisers, and other agricultural inputs cannot be reliably ensured. Section 2 will deal with alternatives to primary production's dependence on the global market, which can be supported by a quality infrastructure.

The impact of the Covid-19 pandemic has emphasised the relevance of firmer anchoring in social and sustainability standards to improve the situation for employees and for the environment. Standards that deal exclusively with the social aspects and criteria of sustainable economic activities are mostly private standards. Section 3 will highlight how firmer anchoring in social and sustainable standards can contribute to the alleviation of the effects of the pandemic.

Changes to the general conditions require innovation at all levels. In the context of a crisis like the ongoing Covid-19 pandemic, the pressure to innovate is particularly intense and urgent. Alternatives to the usual processes, products and services must be found quickly for stakeholders to remain capable of acting and reacting to novel needs. Countries of the Global South in particular need targeted support in the field of incremental and radical innovation, as illustrated in Section 4.

Section 5 will be dedicated to the intervention area of quality infrastructure in the field of sustainability and resilience. In this context, potential solutions exist in the field of digitization and **industry 4.0**, in minimising ecological risks, and in business continuity management.

This discussion paper was authored by a team of both internal and external experts¹. It was developed within the scope of a recently constituted task force of the International Cooperation Department of the Physikalisch-Technische Bundesanstalt that looks for innovative solutions to the challenges of the Covid-19 pandemic.

In addition to pandemic-related support, the task force has also worked on more general quality infrastructure topics in the health sector, such as the certification of protective medical clothing and the testing of respiratory equipment. Articles on these subjects can be found on the task force's website at www.covid19.ptb.de.

¹ The experts involved are Saida Bunk, Oliver Ditthardt, Josefine Greber, Hanspeter Ischi, Jutta Krawinkel, Jonathan Krull, Daniel Lambart, Iris Nadolny and Christian Schoen.

1. Risk Management in Global Supply Chains

The Covid-19 pandemic is having extensive adverse effects on the production safety of businesses, but on the respective supply chains in particular. The manufacturing sector is a vital element of these supply chains; firms from the service sector (e.g. tourism) depend on it. Here, quality infrastructure can play a supportive role, and, by implementing quality assurance processes and services, actively contribute to businesses' ability to remain competitive, even in situations such as the ongoing pandemic.

Due to its novel nature, it is difficult to predict how the situation might evolve. It would be beneficial to capture the dynamics of the situation and present it on a digital platform, and to communicate global requirements and changes to the trade sector and suppliers. To date, a tool like this has not been available, and, as a consequence, measures have been taken individually and are not compulsory.

Against the background of the pandemic, the following aspects need to be prioritised:

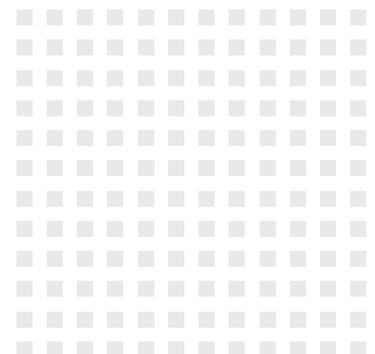
- a. Analysing and assessing the risks in the supply chain and prioritising key suppliers to avoid dependence and disruptions caused by the pandemic. The availability of components that are of critical importance can be ensured, for instance, through efficient stock management.
- b. Implementing a hygiene management plan in the production process that aims to reduce contamination risks for staff and maintains the business' operability.
- c. Minimising the contamination of products and ensuring consumer protection by implementing quality standards and expanding phytosanitary measures.

To date, there have been hardly any recommendations or standardised processes for implementing protective measures related to a pandemic in supply chains. Binding provisions for stakeholders in global trade is, therefore, an essential step towards maintaining the operability of international supply chains. This applies both to the internal processes of companies and to product safety.

Adjusting work processes within companies should also lead to rethinking production processes. More spacious workplaces, improved ventilation, the increased use of tested protective clothing, and applying stricter regulations for migrant worker accommodation can have a positive effect both on safety at work and on social conditions.



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2. Implications for Agricultural Value Chains

In the countries of the Global South, the Covid-19 pandemic could be perceived as an opportunity for small-sized agricultural structures, as dependencies from imports might be disrupted. National and regional products could replace cheap imported goods. A more robust regional integration, the diversification of products, and better connections between regional value chains are preconditions for these changes. Stakeholders are facing structural and logistical challenges, and the need to improve the quality of products has become apparent. To achieve this, increased use of quality infrastructure and its service providers is necessary. This will eventually lead to enhanced consumer protection.

As well as this, new standards must be developed and implemented at the national level – and, if applicable, at the regional level. These standards should not exclusively address producers of agricultural products but take the

entire national supply chain into account. This not only refers to manufacturers of agrochemical products in particular but also to producers of agricultural machinery. Essential regulations must be anchored at an institutional level and be centralised by the legislative bodies. From a holistic approach, the measures may be exhaustive and should, therefore, be planned in pilot sectors with the highest possible cost/benefit ratio.

The objective is to become less dependent on imports and to increase national production as it contributes to food security. In doing so, it is essential to maintain compliance with defined quality standards and to promote the support of metrological services in order to guarantee the best possible level of consumer protection at the national level and to minimise the risk of employees becoming infected during production.

3. Stronger Anchoring of Social and Sustainability Standards

Currently, there are no harmonised, legally binding provisions on social and sustainable production in the European Union similar to, for example, the EU regulation on organic production of agricultural products. This regulation defines criteria for each level of production and processing in order to guarantee the integrity of organic agricultural products. The German Federal Ministry for Economic Cooperation and Development is campaigning for a law to prevent damage to humans and the environment in supply chains. Furthermore, some challenges are intrinsic to the system when it comes to implementing existing social standards. Structural problems within the auditing and certification process of the textile sector are one example of such challenges.

The institutions within a quality infrastructure can provide support in developing and implementing social and sustainability standards along an entire value chain. The Covid-19 pandemic has clearly shown which social and human rights related risks global supply chains are faced with. At present, no one knows how efficient private social standards are during the pandemic. Do private standards protect workers' health, rights, and remuneration? Are they better off than those working in businesses without certification according to a private social standard? Furthermore, the question arises as to how various security and monitoring measures could be improved to ensure the efficient implementation of social and sustainability standards.

Many areas are affected by the pandemic (e.g. agriculture, the textile sector, the mining sector, and the automotive and technological sectors). From the employees' perspective, several problems emerge:

- a. Workers lose their jobs due to factory closures (e.g. in the textile sector), and seasonal workers cannot find jobs (e.g. due to the curfew in India during the tea harvest). Social security systems are often not sufficiently developed or are not available at all.
- b. Audits proving compliance with social standards cannot be carried out everywhere on-site at the required severity levels. There is a risk that infringement of agreed standards may not be detected.
- c. Reports have shown that the required hygiene measures are not sufficient when factories resume work (e.g. in the textile sector) or during the harvest in agricultural enterprises, and so these workers are at an increased risk of infection.

Currently, only a few known standards bodies have introduced new **ad hoc** rules in connection with the Covid-19 pandemic, as the provisions for amending standards are tedious. One positive example worth mentioning is Fairtrade International, which, as a standards body, has reacted quickly. In this case, companies with wage-earning employees are granted the option to transfer up to 100% of the Fairtrade premium to producers, in the form of direct payments, until the end of September 2020. This value usually comprises of between 20% and 50%. For consumables, contributions in kind are currently admissible as well.

Audit techniques have been partially modified so that part of the audits can be carried out as remote document checks. This is not sufficient, however, especially when it comes to verifying social standards. There is a high risk when using remote procedures, that management may adapt documents to comply with legal provisions. However, this might not correspond to the actual situation within the company (e.g. when documenting factors such as maximum working time). Checking these documents by interviewing workers on-site should be an essential part of these audits and should not be replaced by a remote procedure. This has not always been guaranteed during the Covid-19 pandemic.

Usually, social standards provide social security (e.g. a period of notice), which, when available, is in line with the legislation of the respective country or with the standards of the International Labour Organization. Due to the Covid-19 pandemic, hygiene measures have increased in importance. However, within social standards practice, hygiene measures are currently only being taken into account as more general rules of **Health and Safety**, which is not sufficient.

Additional standards and requirements do not automatically provide better protection. The application of these standards must be ensured, for instance, by having competent bodies monitor their implementation. As such, it is crucial to include the local stakeholders responsible for the implementation of social and sustainability standards.



4. Opportunities Offered by Innovation

During the Covid-19 pandemic, the quality infrastructure, like the whole economy, is under huge pressure to innovate. This is not only true for local quality infrastructure institutions, but for organisations acting at the international level, such as the Physikalisch-Technische Bundesanstalt, that, through their actions, strengthen the quality infrastructures of countries of the Global South. Innovation is an interdisciplinary topic. It encompasses the modified need for services, and the revised services the quality infrastructure for sustainable economic development can offer. Furthermore, it includes the health-care system, the digital infrastructure, and digital learning formats.

In times of crises especially, different stakeholders of an innovation system will implement changes, both independently and in mutual interaction. When it comes to quality infrastructure, the innovation system mainly consists of the institutions of a quality infrastructure, businesses, and the regulatory institutions that lay down the framework conditions:

- a. Quality infrastructure institutions innovate the type of services they offer, the way they provide these services, and the way they communicate with their customers.
- b. Businesses (i.e. customers of quality infrastructure institutions) innovate by modifying their products and processes. For instance, by reorganising their supply chains, by utilizing the available quality infrastructure services in a novel way, and by using new quality infrastructure services. These could, in the medium term, include new recertification in management systems such as ISO 22301, **Business Continuity Management**, (cf. Section 5 of this document), as well as the application of the international standard on innovation management of the ISO 56000 series.
- c. Regulatory authorities are expected to innovate by adjusting complex procedures in the short term first – and subsequently in the long term, if they prove successful – and then technical regulations in the medium term. Even though the innovation processes of authorities are often somewhat cumbersome, the Covid-19 pandemic has shown that some of them can be accelerated.

Within the scope of the ongoing pandemic, innovative responses by quality infrastructure institutions, when observed from a global perspective, can be classified into various intervention areas. The current pressure to innovate often accelerates trends that were already starting to emerge (e.g. digitization of quality infrastructures, using remote services, and the introduction of new services).

The national and international innovation systems of a quality infrastructure form networks and alliances which enable an exchange of knowledge as a basis for innovation. These innovation systems are networks made up of quality infrastructure stakeholders (e.g. institutions, businesses), who are in regular interaction with each other and whose interaction is essential for their innovation activities. To encourage innovation in these pandemic times, the expected exchange within existing networks must be intensified, and new cooperation networks, as well as networks for the exchange of knowledge, must be created.

The speed and extent of innovative actions within quality infrastructure institutions vary in the face of the Covid-19 pandemic. However, international development organisations can encourage innovative behaviour in a targeted way. This would start with collecting, sharing, and feeding examples of innovation activities from different partner countries into national networks. This can be supported further through technical consultation when shaping and implementing innovations of processes and services, but also by quality infrastructure institutions, and by co-financing technical procurement. In addition, quality infrastructure institutions can be encouraged to share temporarily available resources with other institutions.

Similarly, public facilities and quality infrastructure institutions encourage innovation in businesses' quality assurance. Collecting and sharing examples of innovations within companies from one's own country, and neighbouring countries, is a valuable approach here, too. These case studies can be disseminated using e-seminars and/or other virtual events.

Digital communication is a critical technology for quality infrastructure innovation during the Covid-19 pandemic. Enhancing technical capabilities and equipment in order to enable the use of digital technology in networks and quality infrastructure innovation systems should, therefore, be considered an absolute priority.

5. Sustainability and Resilience

Businesses of the Global South have faced significant challenges due to the Covid-19 pandemic. Measures aiming to support sustainability and to develop the resilience of companies are, therefore, particularly important and should be implemented within the scope of technical cooperation projects. Additionally, innovation, modern technologies, and digitization can help businesses maintain the balance between economic, ecological, and social aspects, thus improving their competitiveness.

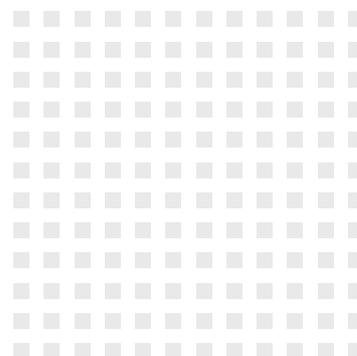
Against the background of digitization, industry 4.0-related technologies offer the possibility of drastically reducing throughput times in production, and of increasingly interconnected, automated production that is aimed towards the particular needs of individual customers. Even though this may not be relevant to many countries of the Global South yet, introducing such measures offers excellent opportunities for businesses to remain competitive in specific pilot sectors. Systematic strategic planning and innovative thinking at all levels of business are prerequisites for this. Moreover, a corporate strategy that is supported by the whole company may have a stabilising effect. Quality infrastructures provide support in this case, employing normative basic principles in the field of information security and management. Local certification bodies can pass on these basic principles within their own training measures. Setting up testing and calibration capacities in the field of electronics and in electrical engineering can contribute to the support of these processes.

In order to ensure enhanced sustainability and resilience, additional measures to reduce environmental stress must be implemented. These measures must apply at all levels of a supply chain. Since ecological risks may lead to a rupture in supply chains, minimising any corresponding risks is essential – and not only from an environmental point of view. ISO 14000, **Environmental management**, and ISO 28000, **Supply Chain Management**, are standards that are particularly relevant here.

Continuity management also offers opportunities in sustainability and resilience. Continuity management aims to ensure that businesses think about possible incidents (such as a pandemic) ahead of time, so that they might set up a list of options on how best to react to these incidents in order to minimise their impact. Implementing the ISO 22301 standard, **Business Continuity Management** guarantees that businesses are more able to adapt to changes in external conditions and, as such, are better prepared to weather external shocks. Part of continuity management is following the ISO 31000 risk management standard, which tackles issues at strategic and operational levels, and extends to the entire supply chain. Risk management aims to set up emergency plans so that businesses can maintain their activity during and after a major **disruption** (such as the Covid-19 pandemic). Therefore, both standards should be available in countries of the Global South, and certification bodies should be set up and trained correspondingly.

6. Conclusions

Targeted support of the quality infrastructure in countries of the Global South can contribute to them overcoming the impact of the current pandemic, and other crises. Moreover, this is an opportunity to adapt current processes to increase sustainability and resilience in those countries. Risk management in global supply chains, increased regionalisation of agricultural value chains, the rigorous introduction of social standards, and the importance of innovation are, in this context, aspects that are particularly worth emphasising. Some concrete measures to tackle these issues are compiled in Annex I.



Annex I – Suggestions for Possible Measures

Measures highlighted in grey are already being implemented.

Description	Possible partner institution(s)	Example	Relevant for ...
Digitization of the quality infrastructure			
Online service for public licensing in the food industry	Competent ministries in the partner countries	Nepal	Section 4
New acceptance procedure for measuring instruments with as little contact to the customer as possible (one-stop desk, partly digital)	Testing and metrology system	Myanmar	Section 4
Capacity development for remote services in the field of certification and accreditation (remote audit and/or remote appraisals); flexibility of due dates and validity periods	Certification bodies, standards bodies, and accreditation bodies	South Africa Nepal	Section 4
Digitization of the accreditation process	Accreditation bodies	Tunisia	Section 4

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Description	Possible partner institution(s)	Example	Relevant for ...
Support through hardware and software for the virtual harmonisation of standards (meetings of the technical committees)	Standardisation institutes	Pan-Africa	
(Online) consulting and training measures for businesses on quality-relevant requirements that are defined in standards and/or technical regulations – if possible involving QI partners	Small and medium-sized enterprises	Kyrgyzstan	
Developing online training for ISO 22301, Business Continuity Management , and ISO 28000, Specification for security management systems for the supply chain	Small and medium-sized enterprises (SMEs), quality infrastructure institutions		Section 4, Section 5
Detecting current trends and developments with regard to the Covid-19 pandemic, focusing on product safety and consumer protection for trade and the economy on a digital platform	International organisations	International Trade Center	Section 1
Supporting the introduction of digital calibration certificates	Testing and metrology institutions		Section 4
Organising online training for self-calibration	Testing and metrology institutions		Section 4
Risk assessment and risk reduction			
Risk and resilience management training for businesses and business associations	Standardisation institutes		Section 5
Introducing a risk-based Covid-19 approach for market surveillance authorities	Market surveillance authorities		Section 4
Collecting data for a report on the situation of small and medium-sized enterprises to formulate recommendations for action for the local authorities to support those SMEs	Public health authorities, chambers	Sri Lanka Tunisia	
Setting up a catalogue of precautionary measures following the directives of the World Health Organisation (WHO) for food business operators during the Covid-19 pandemic and distributing it to the food industry	Competent ministries in the partner countries	Nepal	
Supporting campaigns or training measures for businesses connecting hygiene rules with general QM principles	Chambers, standardisation institutes, ministries, public health authorities	Sri Lanka	

Continued on next page

Description	Possible partner institution(s)	Example	Relevant for ...
Developing a hygiene management plan in the fabrication process which reduces contamination risks for the staff and maintains the business's operability	Associations, chambers, ministries (health, economy)		Section 1
Developing hygiene standards for non-food sectors	Standardisation institutes		
Innovation			
Supporting free access to normative documents and standards	Standardisation		Section 4
Offering innovation in quality infrastructure awards to encourage innovation	Competent authorities		Section 4
Organising training measures for the ISO 56000 series of standards on Innovation management	Certification bodies, laboratories, other institutions of the quality infrastructure		Section 4 Section 5
Sustainable supply chains			
Compiling a study on the efficiency of social standards during the current Covid-19 pandemic to derive evaluable criteria (e.g. social security systems in the event of job loss, setting up social funds, hygiene measures) and new audit methods to be used during crises	Standards bodies, control boards, trade unions, businesses		Section 3
Conducting a study on the different security and monitoring mechanisms for relevant social standards and other sustainability standards, if applicable, with recommendations for action to improve these mechanisms	Standards bodies, accreditation bodies		Section 3
Training and accompanying value chain developers in promoting regional products	Stakeholders of a value chain		Section 2

Measures highlighted in grey are already being implemented.

Annex II – Glossary

Industry 4.0

The term industry 4.0 does not only include the use of modern, mainly IT-based, systems, but instead refers to merging these systems – functionality of which develops on an individual basis – to obtain a uniform, joint solution. This means that the system, customers, suppliers (i. e. supply chain), and possibly even their different locations can be united into a uniform system landscape. In doing so, each component of the manufacturing chain is controlled individually, and the products and services can be produced, processed, or delivered automatically.

Consequently, adequate architecture models are required to ensure communication and data accessibility. Suitable data interfaces must also be made available, so that security may be ensured. The certifiable ISO 27001 standard guarantees the security of information management systems. Competent tests and calibrations of electronic systems are also an essential prerequisite.

Innovation

Innovation means finding alternative ways of doing things. In the sense of ‘recombining existing resources’, as expressed by Josef Schumpeter, something new is created when existing elements are combined.

Innovation can also consist of the introduction of efficient work processes (organisational innovation), using better machines or instruments (technical innovation), supplying new products or services (product innovation), or reorganising the managerial aspects of a business (innovation of the business model).

Innovation is based on knowledge, which can be acquired in two ways: by studying and researching alone or by interacting with other (e. g. external) stakeholders. An innovation system is a network of several stakeholders who are in regular interaction with each other, and whose interaction fuels their innovation activities. According to the four-pillar model², an innovation system is composed of four groups of stakeholders: firms, technology institutions (incl. quality infrastructure institutions), and education institutions, and the corresponding framework conditions (incl. the stakeholders who form an integral part of it).

Innovation and invention are not the same. To invent is to identify a new approach for the first time, or to develop a new artefact. An invention is a thing or an event that only happens once, whereas innovation can occur in different organisations and in different places, iteratively.

Incremental and radical innovation

One can differentiate between incremental innovation (i. e. continuous improvement) and radical innovation (i. e. abrupt introduction of new products or processes). Radical innovations are often developed when there is pressure for action – for example, due to a significant crisis.

² Cf.: Mesopartner Working Paper No. 02: *Rapid Appraisal of Local Innovation Systems (RALIS): Assessing and Enhancing Innovation Networks*. https://www.mesopartner.com/fileadmin/media_center/Working_papers/mp-wp02_01.pdf (Last accessed: 01.10.2020).

Sustainable economic development

Sustainable development can be defined as ‘development that meets the needs of the present without compromising the ability of future generations to meet their own needs’.

Metrology 4.0

The concept of metrology 4.0 defines new metrological trends with regard to compliance with novel manufacturing requirements resulting from industrial evolution within the scope of industry 4.0. This concept aims to increase efficiency by using state-of-the-art, smart, manufacturing and measurement procedures. For this purpose, it is of central importance to use smart sensors to monitor manufacturing units, optimise fabrication processes, shorten production cycles, cut costs, and ensure the quality of products.

Resilience and sustainability

For resilient commercial enterprises implementing value conservation and sustainability measures, it is important to balance out the economic, ecological, and social aspects.

As previously mentioned, sustainability and resilience are recurrent terms within discussions pertaining to the ongoing pandemic. According to the World Bank’s capital stock model of 1994, sustainability is defined by three capital stocks: environment, economy, and society. The sustainability capital is composed of the sum of these three capital stocks, and it should not be changed at a global level. High sustainability does not allow for any of the three capital stocks to decrease over a longer period of time, whereas low sustainability requires this only for the sustainability capital as a whole. Sustainability, thus, always involves an additional time component.

A resilient business is one that is able to implement planned measures successfully in order to tackle an immediate crisis. One could therefore say that resilience is a prerequisite for sustainability.

Social standards

According to the definition of the enquête commission of the German Parliament titled **Globalisation of The World Economy**, social standards are an ‘exhaustive and general term for standards used to design work contracts (working time, remuneration, social security, etc.) and for labour rights’. Social standards such as GRASP, or Naturland’s the social guidelines, can contribute significantly to achieving sustainable development goals (SDGs) by 2030.

As regards to social and sustainability standards (e.g. UTZ, Rainforest Alliance), two different testing and monitoring concepts exist in the field of third-party audits to ensure the development, implementation, and monitoring of a standard. These two concepts are the traditional ISO structure and the ISEAL Alliance. ISO standards are used in various sectors, whereas the ISEAL Alliance is encountered in the field of sustainability standards exclusively. Certification schemes such as Fair Trade, MSC, and SA 8000 use both ISO and ISEAL structures.

On the website www.standardsmap.org, the International Trade Center provides a list of 77 standards. Topics such as health and safety are not included in all standards.



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