KOMMERSKOLLEGIUM
NATIONAL BOARD OF TRADE SWEDEN

Advancing the Green and Digital Transition

Possibilities for an expansion of the WTO Information Technology Agreement, ITA3

2024

Preface

The global economy is undergoing a digital transformation that impacts individuals, trade and countries. Access to digital technology is essential to this transformation and can lead to more inclusive and sustainable production as well as spurring innovation, knowledge-creation and the technology diffusion.

Trade facilitates digitalisation through the elimination of MFN-tariffs on goods included in the Information Technology Agreement (ITA) as well as the expansion of the Agreement (ITA2) by participating WTO-members.

In this report, we seek to contribute to a discussion of whether a further expansion of the ITA could be used as a tool for increasing access to digital technology and to promote the Sustainable Development Goals of the 2030 Agenda.

We present several recommendations to both policymakers and businesses worldwide, as they have important roles to play in achieving progress in this area.

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Anders Ahnlid
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Summary

The World Trade Organization's plurilateral Information Technology Agreement (ITA) as well as the Expansion of the Information Technology Agreement (ITA2) have not only contributed to elimination of MFN-tariffs on ITA-products in all participating countries but also to increasing predictability and transparency and the spread of digitalisation. However, due to the rapid pace of digital development, certain goods that are vital to digitalisation are not covered by the agreements. We have therefore looked into the possibilities offered by a new expansion of the Information Technology Agreement i.e., ITA3.

There are several steps that could be taken to raise interest and promote constructive discussions on an ITA3. We make the following recommendations:

- **We propose a discussion of an ITA3 on the WTO's ITA Committee**
  To ensure that the ITA continues to support the digital transformation, the participants need to engage in reviewing product coverage. A proposal from the EU could contribute to making this happen.
- **Explore the potential to use ITA3 as a tool for promoting the Sustainable Development Goals (SDGs) of the 2030 Agenda and initiate a series of informal meetings on an ITA3 before the 14th Ministerial Conference (MC14)**
  As a first step, as the digitalisation of agriculture is a priority for many WTO members, it may prove useful to initiate a workshop or an informal meeting in the WTO on digital technology used in agriculture. We also suggest that subsequent workshops/informal meetings be organised for other sectors such as medical technology, renewable energy and recycling and waste management, as well as any other sectors deemed to be of interest.
- **Businesses should show greater commitment to identifying products for liberalisation in a future ITA3**
  The involvement of more businesses worldwide will be essential, as more work needs to be done to identify products for inclusion in a future ITA3. We encourage the participation of companies, producers, exporters, importers and users operating in relevant sectors as well as business organisations. Once more products have been identified, a subsequent dialogue with trade policy makers will be possible and highly relevant in view of the MC14.
- **Provide capacity building and technical support to developing countries**
  To ensure the inclusiveness of ITA discussions, capacity building and technical assistance could be offered to developing countries now, before any negotiations begin on ITA3 regarding which products to include and staging periods. These discussions could be conducted between the EU and African countries, for example within the framework of the Africa-EU Partnership.
- **Raise awareness and encourage more WTO members to become participants in the ITA and/or ITA2**
  It is important to continue to raise awareness of the benefits of the ITA and ITA2, including how the ITAs can help participants to bridge the digital divide in various ways.
- **Address barriers to trade in indispensable services**
  The sale of products and services is deeply intertwined in many sectors and especially in high-tech sectors such as renewable energy and medical technology. To fully realise the benefits of any new zero-tariff agreement on ITA-products, barriers to trade in services also need to be addressed.

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Abbreviations

BIR – Bureau of International Recycling

EV – Electrical vehicle

FAO – Food and Agricultural Organization of the United Nations

GPS – Global Positioning System

HS – Harmonized Commodity Description and Coding System or Harmonized System

ICT – Information Communication Technology

IoT – Internet of Things

ITA – Information Technology Agreement

ITA2 – Expansion of the Information Technology Agreement

ITU – International Telecommunication Union

LDC – Least developed countries

LiDAR – Light detecting and ranging

MFN – Most Favoured Nation

NTB's – Non-Tariff Barriers

RFID – Radio Frequency identification

SDGs – Sustainable Development Goals

VR – Virtual Reality

WCO – World Customs Organization

WHO – World Health Organization

WTO – World Trade Organization

1 Introduction

Access to digital technology is crucial for the ongoing transformation of the global economy to achieve the Sustainable Development Goals (SDGs) of the 2030 Agenda. Digital technology has the potential to promote more inclusive and sustainable production, as well as spurring innovation and technology diffusion. The products covered by the World Trade Organization's (WTO's) plurilateral agreements in this area, the *Information Technology Agreement* (ITA) and the *ITA Expansion* (ITA2), make important contributions to facilitating the digital transformation. Since ITA2 was concluded in 2015, the digital transformation has continued to gather pace, prompting the question: Is the time right for a further expansion of the ITA?

Some may argue that this is the case. In 2022, the global tech industry called for another ambitious expansion of the agreement arguing that: *"an ITA-3 would bring many important emerging technologies driving the global digital economy under ITA coverage..."*.[1]

According to paragraph 3 of the Annex to the ITA, the participants are required to meet periodically to review product coverage in the light of technological developments. While this is a standing item on the agenda of the WTO's ITA Committee, thus far no new products have been added since the expansion was agreed in 2015.

The purpose of this report is to examine whether a further expansion of the ITA could be used as a tool to enhance access to digital technology and to promote the SDGs. By doing so, we seek to contribute to a discussion on a future expansion of the ITA.

The report is a desk study and, through a literature review, we have attempted to identify examples of products that could be included in a future ITA3. We have limited the scope of our investigation to products of relevance to a handful of sectors – agriculture, medical technology, renewable energy, and recycling/waste management – as these are examples of sectors in which the use of digital technologies is clearly linked to one or more SDGs. The identified products have been compared with product coverage in the ITA and ITA2 in order to identify products that could benefit from a further expansion in the form of an ITA3.

We do not address specific non-tariff barriers (NTBs) in this report.[2]

1 Global Tech Industry (2022).

2 Even though the possibility to consult on NTBs is a part of the Information Technology Agreements.

1.1 The Information Technology Agreement (ITA) and the ITA Expansion (ITA2)

The Information Technology Agreement is one of the major contributions of the WTO to liberalising international trade over recent decades. The ITA is the result of an initiative agreed at the First WTO Ministerial Conference in Singapore in 1996, at which 14 participants[3] declared their intention to reduce customs duties on certain listed information technology products. The tariff liberalisation was to begin in 1997 and be concluded by 2000, provided that participants representing approximately 90 per cent of world trade in information technology products had by then notified their acceptance.[4]

More countries did indeed agree to participate and the agreement was concluded on 26 March 1997, after coverage had reached 92 per cent of world trade in these products. Some participants were granted extended staging periods until 2005. Since then, more WTO members have joined the ITA either when acceding the WTO or at a later date. In total, 83 WTO members are participating in the original ITA.[5]

Box 1. The Information Technology Agreement (ITA) and ITA Expansion (ITA2)

ITA and ITA2 are plurilateral agreements within the WTO with:

- bound zero tariffs based on the MFN principle on goods covered by the agreement when imported into a country that participates in the agreement;
- no burdensome rules of origin; and
- all WTO-members benefitting from improved market access.

The ITA covers, inter alia, computers, telecommunication equipment, semiconductors, printed circuits and semiconductor manufacturing equipment, and certain instruments for measuring or checking, etc.

ITA2 covers, inter alia, medical equipment (pacemakers, electro-cardiographs, scanners, machines for dental and ophthalmology), GPS, telecommunication satellites, video games and consoles, microphones and headphones, etc.

In 1996, global exports of ITA products amounted to USD 549 billion. This figure had increased to USD 2 trillion by 2020[6] and USD 2.5 trillion by 2021. This can be compared to total global exports of goods amounting to USD 22.3 trillion in 2021.[7] The ITA has also helped to reduce the prices of imported IT products.[8]

Global exports of products covered by ITA2 amounted to almost USD 1.8 trillion in 2020,[9] greater than the comparable figures for chemical, agricultural and automotive products. In 2021, ITA2 exports are estimated at around USD 2.1 trillion.[10]

The ITA is considered to be one of the most successful of the WTO's plurilateral agreements.

Source: WTO

3 European Community counting as one.
4 WTO Document (1996).
5 WTO Document (2022).
6 WTO (2021a).
7 Total World Merchandise exports during 2021 amounted to 22 343 840 million USD according to WTO STATS.
8 WTO (2023a).
9 WTO (2021b).
10 WTO (2023a).

Due to the rapid evolution of the IT sector, some participants decided to enter into new negotiations regarding the expansion of the agreement. The negotiations were concluded at the WTO's 10th Ministerial Conference, which was held in Nairobi in December 2015. The result was the elimination of tariffs on an additional 201 products. These tariffs were phased out between 2016 and 2019, with longer staging periods for sensitive goods.[11]

Several participants in the ITA decided not to join the expansion of the agreement, i.e., ITA2. Among the reasons for non-participation were a lack of political will,[12] no interest in further trade liberalisation[13] and the rejection of requests for longer staging periods.[14]

At the time of writing, over 50 WTO members are participating in ITA2, see Appendix 1.

Both agreements cover certain products that are not classified as ICT products[15, 16] However, the participants considered it important to include these products, such as parts, components and instruments, as they were needed within or adjacent to the ICT sector. Medical apparatus was included since the med-techindustry had highlighted their link to the ICT sector and that the sector was becoming more digitalised and the importance of these kind of products to improved health.[17]

To ensure that the value of the agreements is maintained, it is of the utmost importance that commitments, i.e., bound zero tariffs on MFN-basis, on all goods covered by the ITA/ITA 2 are respected by all participants. Compliance is monitored by the ITA Committee.[18]

The loss of government revenue in the form of customs duty can be a problem and may be seen by some countries as conflicting with their own interests. At the same time, eliminating tariffs on ITA-products could lead to lower prices and increase availability, a development that in turn can enable the digitalisation of sectors such as healthcare, agriculture and education. The benefits of a zero-tariff approach, including opportunities to benefit from global value chains, must be balanced against the immediate loss of government revenue.

There might also be other constraints that influence a country's decision on whether to participate in the ITA, such as regional trade agreements or membership of a customs union. If the other parties to such agreements have no interest in joining the ITA it is impossible for the interested country to join the ITA since removal of tariffs on ITA-products from third countries would breach existing agreements.

11 WTO Document (2015).

12 It is also suggested that some countries joined the ITA, for example Bahrain, Honduras, Morocco, Nicaragua, likely significantly motivated by a free trade agreement with US according to Henn, Gnutzmann-Mkrychyan (2015).

13 For example, India did not intend to join ITA2 because of dipped manufacturing due to ITA. WTO Document (2023).

14 Turkey decided not to participate in ITA2 due to its (tariff)schedule while Dominican Republic and El Salvador renounced joining since they wanted much longer staging periods, according to the European Commission (2016).

15 UNCTAD (2015).

16 UNCTAD uses the OECD definition of ICT products when publishing data. This means that all goods included in the ITA-agreements are not covered by the UNCTADStat for ICT and some goods included by UNCTAD are not included in the ITA-agreements.

17 WTO (2017).

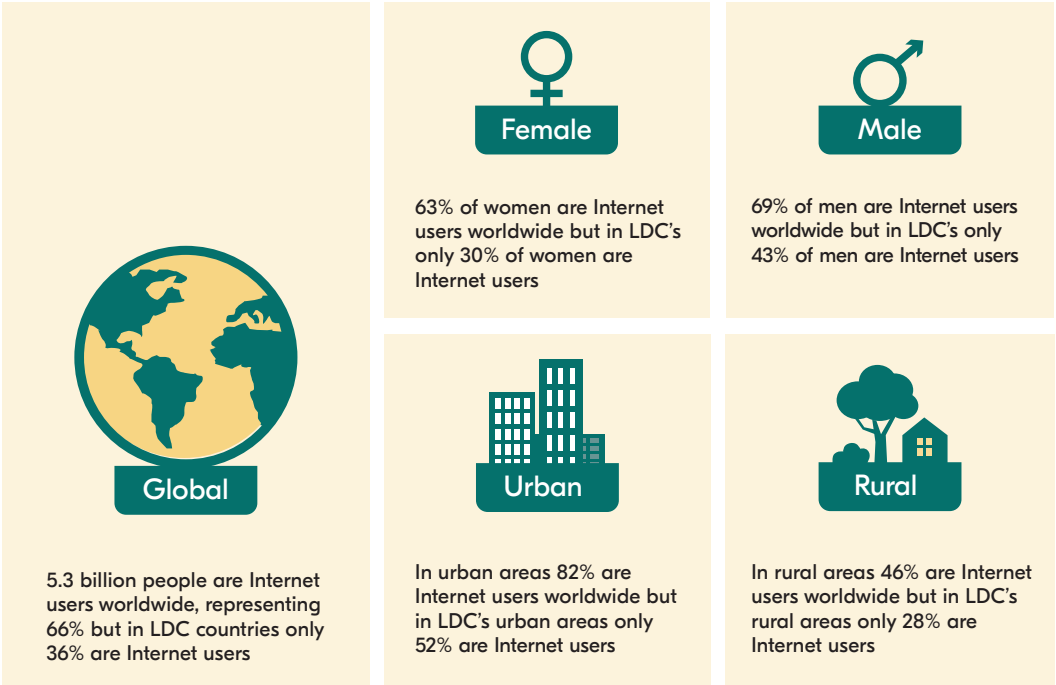
18 WTO Committee of Participants on the Expansion of Trade in Information Technology Products.

1.2 ITA can contribute to bridging the digital divide

The term *digital divide* refers to the gap between individuals, households, businesses and geographic areas with regard to access to information and communication technologies, thus placing some at a socioeconomic disadvantage. The ability of developed countries to shape the direction and thus reap the benefits of technological development also creates a digital divide.

In 2022, the estimated number of internet users worldwide was 5.3 billion, or approximately two-thirds of the global population (see Figure 1). This means that some 2.7 billion people around the world did not have internet access. Access to digital technologies varies not only between high- and low-income countries but also between urban and rural areas, between different age groups and between women and men.

Figure 1. Internet users worldwide in 2022 compared to internet users in least developed countries (LDCs)



Source: ITU

In 2022, 73 per cent of the global population owned a mobile telephone. The corresponding figure for least developed countries (LDCs) was lower, at 58 per cent.[19]

There are a number of factors that contribute to the digital divide, including:

- lack of affordability;
- lack of ICT infrastructure i.e., internet connectivity, mobile coverage, hardware, software and electricity;
- lack of digital skills or lack of motivation;
- illiteracy;
- lack of opportunities to learn how to use digital technology; as well as
- gender, age or cultural factors.

Developing countries and emerging economies face a serious challenge. On the one hand, the digital economy and digital technologies present opportunities to play economic and technological catch-up and build capacity. On the other hand, these technological shifts threaten to widen the digital divide. A digital divide within a country can create a democracy gap within society, as well as hamper progress in various sectors such as agriculture, healthcare and education.

Digitalisation helps to build efficient and resilient economies. During the COVID-19 pandemic, digitalisation became critical to addressing health and economic crises as well as enabling resilience.[20] However, the digital divide became even more visible within and between countries during the pandemic. For example, in many cases digitalisation enabled people to work from home, attend digital meetings and order food, medicines or other necessities on-line, as well as to access digital healthcare and distance education[21, 22] on their smartphones or other internet-enabled devices. Some

19 ITU (2022a).

20 UNCTAD (2022).

21 According to UNICEF (2021), schoolchildren worldwide have lost 1.8 trillion hours and counting of in-person learning due to COVID-19 lookdowns.

22 The figure 1.8 trillion hours is probably a significant underestimate as the pandemic continued after this figure was arrived at. Schoolchildren and students who were able to continue their schooling online using computers or other internet-enabled devices and a functioning internet connection had a huge advantage.

countries were better placed than others to continue research, collect data in the quest for vaccines or to develop methods to combat the pandemic.

In addition to the technical aspect of the digital divide, there is also the knowledge-based divide that hinders countries from participating in the digital economy. One way to bridge the gap is by providing ICT skills by equipping classrooms with and promoting access to computers or tablets, as has been done in Burkina Faso, Cabo Verde, Comoros, Ethiopia, Kenya, Gabon and Mauritius[23], as well as many other countries around the world.

In 2022, a higher percentage (75%) of the global population in the 15–24 age group used the internet than in the rest of population (65%). In Africa, internet usage was also higher in the 15–24 age group than in the population as a whole, 55 compared to 36 per cent.[24]

Another way to bridge the gap is to ensure that everyone has access to and can use digital technologies, such as by offering digital training or providing mobile phones to women, expanding fibreoptic networks to improve broadband access and providing good-quality internet access at an affordable price.[25]

The most essential aspect of bridging the digital divide is to promote digital inclusion by ensuring access to affordable computers, mobile phones, telecommunication equipment and ICT infrastructure. Joining the ITAs is one step towards inclusiveness as well as a way of keeping pace with digitalisation, since these types of products enable digitalisation.

Or to quote Ambassador Latsamy Keomany of Lao People's Democratic Republic on Lao becoming the first LDC to sign up to both ITAs: "*Our ICT sector is at an infant stage. Therefore, joining the ITA agreements serves as a springboard or a means to nurture our ICT sector by bringing consumers and producers to reap opportunities offered by the integrated world economy*".[26, 27]

In conclusion, access to ICT products is the key to connectivity, since they are the foundation of ICT infrastructure. The ITA participants have eliminated tariffs on computers, telecommunication equipment and much more. This has reduced costs and increased trade, investment and opportunities to benefit from global value chains, as well as enabling e-commerce. However, despite the potential benefits of the ITAs there are many developing countries that are yet to join or who participate in the original ITA but not ITA2. One positive development is that a second LDC, Timor Leste, has joined both ITAs.[28]

23 FAO and ITU (2022).
24 ITU (2022b).
25 UN (2023).
26 WTO (2021b)
27 Certain tariffs will be phased out by 2026.
28 WTO (2023b).

2 Analysis

In this section, we analyse the sectors agriculture, medical technology, renewable energy, and recycling and waste management. In each sector, we have identified products that could be included in a future ITA3. At the end of this analytical section, we briefly look into the tariffs applied to certain products.

2.1 Agriculture

Food systems all over the world are facing a triple challenge. They need to ensure food security and nutrition for a growing world population and support the livelihoods of the millions of people working in agriculture and other parts of the food supply chain, while at the same time making production more environmentally sustainable. Meeting these challenges will require higher and sustainable productivity growth.[29] Digital technologies and tools can provide farmers with various types of data to support better decision-making and lead to more precise and efficient use of inputs and more automated production processes. Digitalisation therefore has the potential to contribute to this much needed sustainable productivity growth. According to the Food and Agriculture Organization of the United Nations (FAO), digital technologies "may be part of the solution" to achieving the transformation to productive, efficient, sustainable, inclusive, transparent, and resilient food systems.[30] Access to digital technologies is not only beneficial to large farms, small farms could also benefit but this requires that digital tools be adapted to the socioeconomic conditions of these farmers.[31]

There is, however, a risk that the benefits of the digitalisation of the agrifood system will be unequally distributed due to the digital divide between rural and urban areas in developing countries in particular.[32] There are many factors contributing to the digital divide, such as low levels of e-literacy and digital skills and weak technological infrastructure and connectivity. Where there is functioning infrastructure and connectivity there could still be barriers to the adoption of digital technologies in agriculture, such as *costs* (for devices and subscriptions), *relevance* (suitability of tools to farm size and specific conditions), *user-friendliness* (depending on digital skills, the farmer's age, etc.) and issues related to *risk and trust* (perceived benefits, ownership of data, distrust in technology).[33] As affordability is an important factor for the adoption of digital tools, trade policy can be used as one of several tools to facilitate the adoption of digital technologies, at least when the physical tools required to benefit from digital technologies in farming are subject to tariffs[34] or technical barriers to trade, or when there are trade barriers to services linked to these tools.

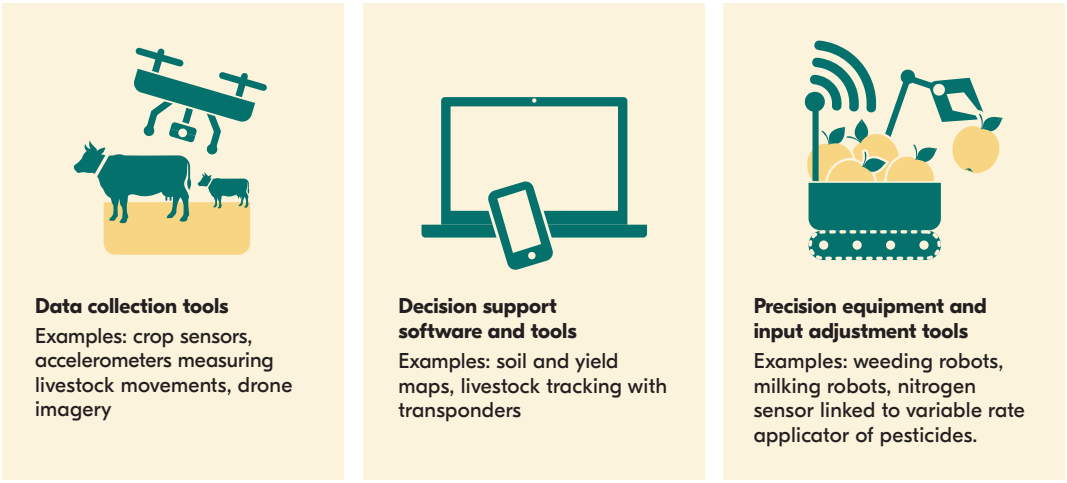
Many different types of digital tools can be used in agriculture, ranging from mobile phones and tablets, which can be used to, for example, receive customised advice, price information and alerts on weather, pests, and diseases[35], to more advanced equipment such as agricultural robots. Mobile phones or other internet-enabled devices can also be used to access digital auction platforms for second-hand agriculture equipment. For

29 OECD (2022a).
30 FAO (2019).
31 Fuglie K., Madhur G., Aparajita G., and William F. M. (2020).
32 FAO (2019).
33 OECD (2022b).
34 Ibid.
35 UNDP (2021).

many of the digital tools used in agriculture, after-sales service is an important part of the supplier's offer.

There is no single typology to classify the different digital technologies used in agriculture. However, many typologies seem to identify technologies to record and *collect* data, to aggregate and analyse data to *support decision-making* as well as to react to data and use machinery or inputs with more *precision* (see Figure 2).

Figure 2. Examples of digital tools used in the agricultural sector



Source: The figure is based on the categories of tools and the examples presented in OECD (2022b).

In the following section, we briefly discuss three types of digital tools that are often referred to in the literature on digitalisation and agriculture. Our focus is on *physical goods* linked to digital technologies used in agriculture.

Sensors

Sensors are used for various purposes in agriculture. Sensor technology is a broad category covering tools that can be used in both crop and livestock farming to collect, convert, store and distribute signals and data. In crop production, sensors can be used to detect plant diseases and pests, to measure soil health, nutrient levels in the soil, yield quality and crop ripeness, as well as to monitor the weather.[36] The information generated by these sensors can assist farmers in their decision-making. Sensors can also be attached to or embedded in farming equipment and be used, for example, for smart irrigation, precision planting and variable rate fertilizer and pesticide application. There are also smartphone applications that can give smallholders more affordable access to some types of sensors.[37] The use of sensors for crop production can contribute to sustainability in several ways, for example, sensors that contribute to reducing production losses from plant pests can lead to higher yields, higher income and increased economic sustainability. Furthermore, a more efficient use of land resources for agriculture, less incentive for deforestation, reduced use of fertilizers and more efficient use of water for irrigation can have a positive impact on environmental sustainability.

36 OECD (2022b), UNDP (2021).
37 UNDP (2021).

In livestock production, sensors can be used to register and provide data on physical, physiological and behavioural indicators for individual animals or data on the conditions of the physical environment where animals are kept. The use of such monitoring tools can provide actionable data that could help improve animal health and welfare outcomes.[38] The animal-based tools include smart ear tags or collars that monitor eating, movement, heat and fertility, leg tags that monitor activity and accelerometers to register the animal's movements.[39] Other types of sensors are used in the environment where animals are kept, for example cameras and microphones to detect symptoms of disease in a group of animals. In addition to improving animal health, this could also have a positive impact on the economic sustainability of production. Data collected with sensors can be aggregated and analysed using decision-support software and be accessed using a computer, smartphone or tablet.

Many types of sensors are already covered by the ITA or ITA2. For example, the ITA covers smart cards, sensors for measuring or checking flows or levels of liquids, and humidity, while ITA2 covers certain light and detecting remote sensors LiDAR,[40] as well as accelerometers in animal tags. However, tariffs might still be relevant indirectly for sensors, as some machinery or equipment containing sensors might not be covered by the ITAs.

Drones, or unmanned aerial vehicles (UAVs)

The use of drones in agriculture is growing rapidly.[41] Drones are used for many different purposes including land mapping, crop monitoring, livestock management, seed and tree planting and spraying. Examples of the use of drones in agriculture can be found in developed countries as well as in developing countries. For example, in Africa drones are used for land mapping for climate smart cashew production in Benin, rice production in Burkina Faso, tree-planting in Madagascar and monitoring cane fields in Mauritius, while farmers in Mozambique use drones to support production decisions, i.e., for

38 Health for Animals, global animal health association. (2022).
39 Ibid.
40 Light Detection and Ranging, LiDAR is a remote sensing technology (3D scanning).
41 Croptracker (2023).

precision agricultural projects.[42] The drones are equipped with different devices depending on their intended application, for example, high resolution cameras, infrared cameras, LiDAR, GPS, various types of sensors and spraying equipment.[43] The benefits of using drones for crop monitoring include receiving data that can assist in replanting, assessing fertilizer or irrigation needs or damage caused by natural disasters, providing information on weed development and alerting farmers of plant pests.[44] This implies that there is potential to use drones to prevent the spread of pests that cause production losses and reduced incomes as well as to promote a more responsible and precise use of pesticides and fertilizers, with consequent benefits for environmental sustainability. One advantage of drones as opposed to satellites is that drone images are more accurate with a higher resolution.[45, 46] In livestock production, drones can be used for tracking and counting animals, as well as for monitoring herds to identify potentially sick animals.[47]

Drones are not covered by the ITA or ITA2, although some of the devices that they are routinely equipped with – such as certain digital cameras, GPS, and LiDAR or other sensors – are covered by the agreements.

Agricultural robotics and automated equipment

Agricultural robots – or "agrobots" – are programmable machines that can perform a variety of tasks in both crop and livestock production without direct human intervention.[48] There are already several types of commercially available agrobots and new types are likely to become available in future as the technology is still under development. Some agrobots are designed to perform a specific task whereas others can perform a variety of tasks. In crop production, robots can be used for tasks such as seeding, planting, pruning, mechanical or chemical weeding, pest monitoring, harvesting, packaging and palletising.[49] Among the benefits of using robots in crop production are reduced labour costs for weeding and harvesting, which could increase the economic sustainability of production. Using agriculture robots can also contribute to environmental sustainability by reducing the quantity of herbicides used when weeding, as well as reducing problems with soil compaction (leading to soil degradation), as robots are often much lighter than the conventional equipment they replace.[50] In livestock production, robots can perform tasks such as feeding, watering, milking and cleaning.[51] The benefits of using robots in livestock production may include increased biosecurity, lower labour costs, a healthier work environment and reduced water consumption when using cleaning robots.[52] So, there are benefits in all three dimensions of sustainability.

42 FAO and ITU (2022).
43 UNDP (2021).
44 FAO (2020).
45 Global Ag Tech (2021).
46 BBC.
47 Zenadrone.
48 FAO (2020).
49 Ibid.
50 Ibid.
51 Bazis Group, Mondo Macchina (2015), DLG (2014), Electric Solenoid Valves (2023).
52 Envirologic, OECD (2022b).

One disadvantage that agriculture robots share with drones is that they can be costly to purchase. That said, ownership of a robot or drone is not the only way to gain access to the technology. Asset-sharing business models such as leasing, service provision and collective ownership could make the technologies more affordable for small producers.[53]

Agricultural robots[54] or milking robots[55] are not covered by the ITA or ITA2 although some of the tools agricultural robots are equipped with, such as GPS, LiDAR or other sensors, are covered.

53 FAO (2020), UNDP (2021).
54 exHS8436.
55 exHS8434.10 milking robots or exHS8434.20 dairy machinery robots.

3D printers

Another technology with applications in the agricultural sector is 3D printing, or additive manufacturing, which can be used to produce prototypes or spare parts for agricultural machinery. The benefits of additive manufacturing include the ability to manufacture spare parts locally, on demand and in small series, including for older machinery, and less waste of raw materials during production.[56] The potential to extend the lifespan of machinery and the more precise use of raw materials with little waste have been put forward as environmentally sustainable aspects of 3D printing. Furthermore, additive manufacturing could make the agricultural sector more resilient to distortions and bottlenecks in supply chains for agricultural machinery. The technology could potentially also be used to produce components with enhanced performance and strength.[57] There are also 3D scanners that can be used to make digital copies of physical objects that can then be used in 3D printing.[58]

3D printers are not covered by either the ITA or ITA2, although 3D laser scanners seem to be covered by ITA2.

56 Jordbruksaktuellt (2019), Farming Online (2018).

57 Agri Technica (2023).

58 It should be noted that although there are benefits with 3D scanning, the technology also entails risk of intellectual property rights violations.

Box 2. Vertical farming

Vertical farming is spreading around the world and the global vertical farming market is predicted to reach a value of USD 217 billion in 2029 compared to USD 36 billion in 2022.[59] Vertical farming differs from traditional farming and is often used when there are poor soil conditions, limited access to water or land, difficult weather conditions or in urban areas.

Different techniques are used: *hydroponic farming* where the plants are not cultivated in soil but in a water-based, nutrient-rich solution, or *aeroponic farming* where the root of the plant is in the air and sprayed with a mist. The most common use of vertical farming is for the indoor cultivation of lettuces, carrots, cucumbers, peppers, onions, tomatoes, strawberries, basil, thyme, tarragon and flowers, with sunlight replaced by LED lamps and, in some cases, electricity obtained from renewable sources such as solar panels, hydropower or wind power.

Up to 95 per cent[60, 61] less water is needed for vertical farming compared to traditional farming and therefore this type of farming could contribute to SDG 6 Clean Water and Sanitation. Another positive aspect is that no pesticides are needed. Vertical farming also contributes to SDG 1 No Poverty, SDG 2 Zero Hunger, SDG 9 Industry, Innovation and Infrastructure, and SDG 12 Responsible Consumption and Production.

As the monitoring of the plants is essential to vertical farming, certain companies have invested in products covered by the ITA or ITA2, such as computers, smartphones, digital measurement instruments and sensors[62] that monitor humidity, lightening, fertilisers, irrigation, etc. However, certain LED lamps, drones and robots used in vertical farming are not covered by the ITAs.

59 Svd Näringsliv (2022).
60 Ibid.
61 UNDP (2022).
62 Ericsson.

Conclusion

Many digital tools used in agriculture are already covered by either of the ITA or ITA2, including mobile phones, tablets, GPS equipment, several types of sensors, semiconductors and network equipment. This means that these products should already be duty free on an MFN basis in all countries that participate in the ITAs. For countries that have not signed up to the ITAs and that apply tariffs to these products, there are opportunities to improve market access for these digital tools by joining the ITAs.[63]

There are however digital tools used in agriculture that are not covered by the ITAs, such as drones and several types of autonomous robots. With regard to these products, there is a potential to liberalise trade and promote technology diffusion by a further expansion of the ITA. The same argument could be made for parts and components necessary for the functioning of these tools, such as batteries and LED-lamps.

As the digitalisation of agriculture is a priority for many WTO Members,[64] it should be of interest to look at a potential ITA expansion from an agricultural perspective. As a first step, it could be useful to initiate a workshop in the WTO on digital equipment used in agriculture. During such a workshop, members and international organisations could be invited to explore the current coverage of digital technologies of relevance to agriculture in the ITA and ITA2 as well as the potential benefits of expanding product coverage through an ITA3. It would also be useful to identify tools and technologies of particular relevance to small farms, as these account for over 80 per cent of farms worldwide.[65]

Expanding the ITA to cover more digital tools used in agriculture could contribute to several SDGs through their potential positive impact on yields and incomes, more efficient use of limited resources, more precise and possibly reduced use of inputs with negative impact on the environment and benefits for animal health, as well as improving the working conditions in the agricultural sector. In particular, an ITA expansion covering technology relevant for the agricultural sector would contribute to SDG 1 No Poverty, SDG 2 Zero Hunger and SDG 12 Responsible Consumption and Production.

63 Or by autonomous tariff liberalisation.

64 See for example: Joint Declaration of the Twelfth Meeting of BRICS Ministers of Agriculture, Ministerial Declaration on Transformative Solutions for Sustainable Agriculture and Food Systems, adopted on 4 November 2022, G20 Agriculture Ministers' Meeting Communiqué, September 18, 2021.

65 Lowder, Sánchez, Bertini. (2021). Small farms are defined as farms with less than two hectares.

2.2 Medical technology

Medical technology products covered by the ITAs contribute to SDG 3 Good Health and Well-being. Medical technology could be defined as the technologies that diagnose, treat and/or improve a person's health and wellbeing.

Some products used in healthcare are covered by the ITA, including computers, pagers and certain measurement and monitoring instruments, such as electronic drop counters or certain apparatus.[66] Even more medical devices are covered by ITA 2, including pacemakers, electrocardiographs, ultrasonic scanning machines, computed tomography (CT) scanners, blood glucose monitors, certain ophthalmic and dental instruments, electro-surgical or electro-medical instruments, appliances and parts and certain thermometers, as well as some medical equipment for veterinary uses.

Box 3. COVID-19 and examples of prioritised medical goods included in ITA2

In response to the COVID-19 pandemic certain medical devices were considered as prioritised by the World Health Organization.[67] Some of these are covered by ITA2, for example, patient monitors, pulse oximeters, ultrasonic and CT scanners, flowmeters, electronic drop counters, x-ray equipment and thermometers.

Batteries and LED lamps

Batteries are not covered by ITA or ITA2. Batteries are used in in medical carts, magnetic resonance imaging (MRI) machines, pacemakers, defibrillators and other medical equipment, as well as other machines for disinfection.

LED lights are also used in components in surgical lighting, dental lamps and various kinds of medical equipment. Ultraviolet LED lamps are used in healthcare for disinfection.[68] These products are not covered by either the ITA or ITA2.

Medical and emergency drones

Drones are used to deliver medicines, diagnostic tests, vaccines and first aid kits in many countries, including Ghana and the Philippines.[69] In some parts of Sweden, as well as in other countries, defibrillators can be delivered by drone to save lives when a cardiac arrest has occurred. In Australia and other countries, drones are used in the event of major accidents or disasters such as tornados, flooding or bushfires to obtain a broader picture of what kind of emergency resources need to be deployed.[70]

Smart wearables and VR

Smart wearables (smartwatches, smart bracelets, smart clothing, smart gloves, smart shoes or smart soles) are products equipped with various sensors to monitor heart rate, body temperature, stress or sleep patterns for fitness or medical purposes. Some smart-

66 For example, fully automated polymerase chain reaction (PCR) molecular diagnostic systems used in laboratories or quantitative automatic hematologic analysers and leukocyte differential counters which are classified under HS 9027.89 according to HS2022.

67 WHO (2020a).

68 WCO (2022).

69 ITU (2022c).

70 Australian Government (2021).

watches seem to be classified under HS8517 and thus covered by the ITA, while others are classified under HS9102 and, like most smart wearables, are not covered by the agreements. Virtual reality (VR) headsets are used in healthcare to help patients or provide virtual training and education for medical staff and students. Certain VR headsets are not covered by the agreements.

3D printers

3D printers are used to manufacture implants, artificial joints, prosthetics, etc., for use inside or outside the body, and in the production of medical equipment and components, and anatomical models for educational purposes. During the COVID-19 pandemic, as global supply chains were disrupted, 3D printing became an important means of manufacturing personal protective equipment (PPE), as well as nose swabs and other medical devices. 3D printers are not covered by the ITAs.

Robotics

Robots can improve both patient safety and the work environment at hospitals, clinics or homes for elderly.[71, 72]

Many types of robots are used in the medical technology, including dispensing robots that pick and pack drugs in hospitals or pharmacies. These can prepare medicaments faster, reduce errors and increase patient safety. Medication robots are used for patients receiving care at home or in residential homes for the elderly. A medication robot reminds the patient when it is time to take their medication and can alert caregivers or relatives if the patient has forgotten to take their medication.

In healthcare settings, robots can be used in robot-assisted surgery, to deliver food, medicine or other supplies, or to perform sanitation/disinfection (ultra-violet irradiation equipment) and cleaning tasks, which could be a safer method of cleaning for both patients and healthcare professionals. Social robots that can monitor or interact with patients are also used. However, these kinds of robots are not covered by the ITAs.

71 RISE.
72 Euronews (2023).

Telemedicine and telehealth

The use of telehealth[73] and telemedicine[74] services became more common around the world during the COVID-19 pandemic. Delivering these services requires various devices (hardware) such as computers, tablets, smartphones, monitors, servers, audio-conferencing/video-conferencing equipment, headphones and medical devices, as well as network equipment such as base stations, equipment for the reception, conversion and transmission of voice, images or other data, including switching and routing equipment, other communication equipment and parts, static converters, switches, aerials and antennas and certain optical fibre cables,[75] not to mention software. All of these devices are covered by the agreements.

There are new techniques that use smart cards in devices such as blood pressure monitors, thermometers or pulse oximeters to transmit collected patient data directly, instead of using a patient's smartphone.[76] Smart cards are included in both agreements.

Certain optical fibres, optical fibre bundles and cables[77] are not covered by the ITAs. Nor are telepresence robots,[78] which are used in healthcare environments such as hospitals and eldercare facilities.

Conclusion

The products described above can help to bridge the digital divide by, for example, enabling individuals to access healthcare using telemedicine services or healthcare professionals to receive training using telehealth services.

There are products of relevance to the healthcare sector that could be included in a future ITA3, including batteries for medical equipment, battery storage systems, 3D printers and parts, LED lamps, centrifuges and other laboratory equipment, robots, smart wearables and medical and emergency drones. An expansion of the ITA would contribute to SDG 3 Good Health and Well-being and SDG 9 Industry, Innovation and Infrastructure.

Finally, lack of access to electricity[79] is one of the major problems facing developing countries when it comes to providing quality healthcare. The increased use of renewable energy could solve this problem, which leads us to the next section.

73 Telehealth is defined by WHO as "*the delivery of health care services, where providers are separated by distance. Telehealth uses information communication technology for the diagnosis and treatment of diseases and injuries, research and evaluation and for the education for health professionals*", WHO-ITU (2022).

74 Telemedicine is defined as a component of telehealth and refers only to exchange of valid information for diagnosis, treatment and prevention of disease and injuries, between patient/doctor i.e., remote clinical services, World Health Organization, (2022).

75 HS8544.70

76 Medical Expo (2022).

77 HS9001.10

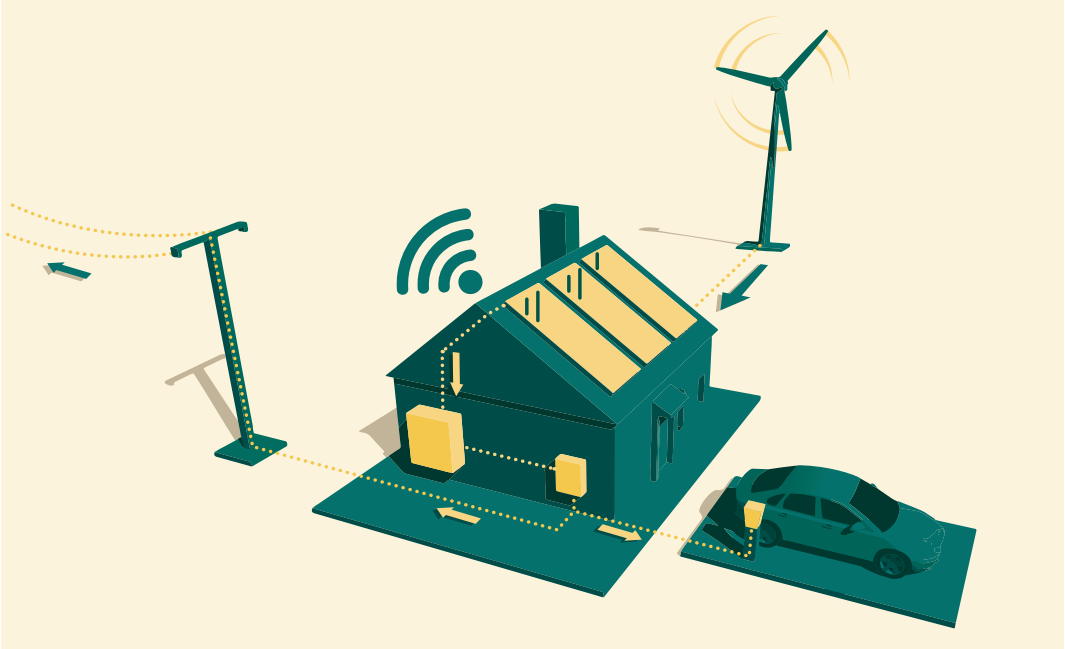
78 exHS8428.90

79 World Health Organization, the World Bank, Sustainable Energy for All and the International Renewable Energy Agency (2023).

2.3 Renewable energy

Renewable energy can contribute to reducing the impact of climate change and achieving the goals of the Paris Agreement but there are also positive local benefits in reducing air pollution, thus improving human and animal health. In many markets, there is a shift towards more renewable energy such as solar and wind power. While climate change is one driving force behind this transition, other factors such as greater energy security and price stability are also playing their part.

The use of solar energy in particular has increased; prices have dropped, and it has become easier for households, industries, farmers and healthcare facilities to invest in renewable energy. Between 2010 and 2020, the cost of electricity generated through photovoltaics decreased by 85 per cent.[80] In addition to solar panels themselves, vital components and assemblies for the production of solar panels, such as wafers and photovoltaic cells,[81] were included in the ITA.



Solar panels are covered by the ITA, while inverters and electricity meters are covered by ITA2. However, important links in the chain such as electrical panels, batteries and energy storage systems are not covered by the agreements.

Semiconductors are covered by the ITAs. High-power semiconductors are key components for controlling power generation and connecting renewable energy sources such as wind power and photovoltaic cells to the grid. LiDAR devices designed for wind measurement and used in wind farm performance monitoring and site assessments are covered by ITA2.[82]

However, electrical panels, batteries and energy storage systems, which are vital to the transition to renewable energy, are not covered by the ITAs. Nor are distribution control panels such as those used for hydraulic turbine generators and wind turbines or solar-water heaters and home-chargers for electric vehicles.

80 IRENA (2022).
81 Photovoltaic cells convert sunlight directly into electricity.
82 HS9015.80

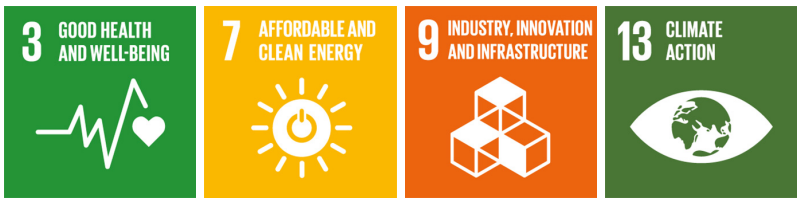
3D printers, which are not covered by the ITAs, are used in the renewable energy sector in general and especially the wind power industry for printing parts and components such as wind turbine rotor blades, as well as for manufacturing photovoltaic cells for solar panels.[83]

Another important product not covered by the ITAs is artificial graphite[84] which is used as a component in certain batteries.

Conclusion

Renewable energy can contribute to achieving the goals of the Paris Agreement and the reduction of global greenhouse gas emissions, but also to reducing air pollution with the consequent improvement to health. Some products that facilitate renewable energy – such as photovoltaic cells, solar panels, certain meters and semiconductors and certain parts for semiconductors, etc. – are covered by the ITAs, while others – such as batteries, different kind of control panels, certain cables, home chargers for electrical vehicles and 3D printers, which can manufacture parts and foundation elements for wind turbines – are not.

An expansion of the ITA would contribute to SDG 3 Good Health and Well-being, SDG 7 Affordable and Clean Energy, SDG 9 Industry, Innovation and Infrastructure and SDG 13 Climate Action.



83 3D Printing Industry (2022).
84 HS3801.10

2.4 Recycling and waste management

Recycling and the circular economy are important responses to climate change and the depletion of global resources. Other factors underlying the increasing interest in this sector include customer expectations, business models and potential cost-savings. In 2019, e-waste (computers, phones and other electronic and electrical equipment) amounted to 56 million tonnes, a figure that is expected to rise to 74 million tonnes by 2030.[85] This can be compared to projected global waste generation of nearly 2.6 billion tonnes in 2030 and 3.4 billion tonnes in 2050.[86] Even though recycling and waste management is often done manually, there seems to be a shift towards the increased use of digital technologies in waste management in some countries.[87]

Equipment

In the recycling process, sensor-based and optical sorting technologies are used in sorting and separation machines and various handheld instruments for sorting and separating different alloys, as well as instruments used for health and safety purposes, including radiation monitoring or radiation detection portals.[88] Recycle machines, so-called *reverse vending machines* for aluminium cans, plastic or glass bottles, etc., are used in many countries. In Sweden, 88 per cent of cans and 87 per cent of PET bottles were recycled in 2022. In total, 2.63 billion items of packaging were recycled.[89] Another example of innovative new technology is garment-to-garment recycling, which allows the customer to recycle an old garment through a process of cleaning, fibre separation, spinning and knitting into a new garment.[90]

Robots that can disassemble batteries and other electronic waste or plastics, sensor-equipped containers and bins that can collect and transfer data, and autonomous street sweepers are also examples of products used in digital waste management. Other

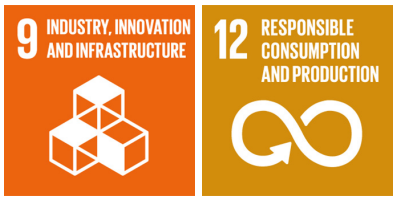
85 WHO (2020b).
86 Kaza Silpa; Yao, Lisa C.; Bhada-Tata, Perinaz; Van Woerden, Frank (2018).
87 Eionet (2020).
88 Bureau of International Recycling, BIR (2022).
89 Pantamera (2023).
90 HKRITA.

devices such as computers, smartphones, broadband internet connections, software, LiDAR, infrared (IR) or near-infrared sensors, cameras, etc., are also needed to support digitalisation in this sector. Drones are also used in waste management to precisely measure the area and volume of landfills and to create up-to-date maps to improve transport and logistics.[91]

Conclusion

Sensors are widely used in waste management, including ultrasonic and infrared fill-level sensors that send an alert when a bin needs to be emptied and radio-frequency identification (RFID) tags that identify individual waste bins. While some sensors used in waste management, as well as computers, smartphones, software, GPS, certain instruments for safety or sorting, are covered by the ITA agreements, other products such as robots, drones and reverse vending machines are not.

The further expansion of the ITA to cover products such as robots and reverse vending machines may lead to more recycling and reduce the environmental impact of consumption, as well as improving working conditions in this sector. This would contribute to SDG 9 Industry, Innovation and Infrastructure, and SDG 12 Responsible Consumption and Production.



91 Swedish Cleantech (2021).

2.5 List of examples and certain tariffs

Our report shows that there are products that could be included in a future ITA3. In Appendix 2, we have compiled a list of products that may be of interest when deciding what to include in an ITA3. The list is by no means exhaustive and includes only products we have identified when examining the sectors described in this report. Some of the products, such as drones, could be considered dual-use items.[92]

Appendix 3 shows examples of applied MFN tariffs on certain goods by the European Union and the following countries: Bangladesh, Brazil, China, India, Kenya, Nigeria and the United States. These countries have been chosen because the EU, China and the United States participate in both ITA and ITA2, India is only participating in the ITA, while Bangladesh, Brazil, Kenya and Nigeria are not participating in either.

The examples in Appendix 3 are products that may be of interest for a future ITA3.

For milking robots, the applied MFN tariff was zero in the EU, Kenya and the United States and 1 per cent in Bangladesh. The applied MFN tariff for milking robots was somewhat higher China and Nigeria at 4 per cent 5 per cent respectively, and higher still in India at 7.5 per cent and in Brazil at 11.2 per cent.

The applied MFN tariff on electric lithium-ion accumulators was very high in Bangladesh and Kenya, at 25 per cent, in Nigeria and India, at 20 per cent, and in Brazil, at 18 per cent. In China, the MFN tariff was lower at 10 per cent. The MFN tariff applied in the United States was 3.4 per cent. This compares to 0 or 2.7 per cent in the EU.

In conclusion, some of the examples in Appendix 3 have high applied MFN tariffs of up to 25 per cent while others have low tariffs from 0 to under 5 per cent.

92 Dual-use items are goods, software and technology that can be used for both civilian and military application.

3 Conclusions and recommendations

The ITA and ITA2 are widely considered to be two of the WTO's most successful plurilateral agreements, providing transparency, predictability and openness for a wide range of information technology products since participating countries have eliminated tariffs on MFN-basis covered by the agreements. The participants represent approximately 96 per cent of world trade in information technology products.

Our analysis indicates that there are several examples of products related to digital technology that are used in a number of sectors but are not covered by the existing ITAs, see Appendix 2. Liberalising tariffs on these products can help to reduce the cost of using digital tools and promote digital technology diffusion, which in turn will contribute to promoting several SDGs and to bridging the digital divide. It is therefore relevant to raise interest in and encourage WTO members to engage in discussion on a future ITA3.

There are a number of steps that could be taken to do this and thereby promote constructive discussions on an ITA3.

- **We propose that the WTO's ITA Committee discuss a future ITA 3**
  Paragraph 3 of the Annex to the ITA requires participants to meet periodically to review product coverage. While the review of product coverage is a regular item on the agenda of the ITA Committee, discussion concerning a further expansion of the ITA has been limited. To ensure that the ITA continues to support the digital transformation, the participants need to engage in such a discussion. A proposal from the EU could prompt them to do so.

- **Explore the potential to use ITA3 as a tool to promote the SDGs and initiate a series of informal meetings on an ITA3 before MC14**
  One way to raise interest in further expansion of the ITA is to explore how it could be used as a tool to promote the SDGs in different sectors.

  As a first step, it would be useful to initiate a workshop or informal meeting in the WTO on digital equipment used in agriculture, as the digitalisation of agriculture is a priority for many WTO members. During such a discussion, WTO members and other stakeholders and international organisations could be invited to share their views on the current coverage of digital technologies used in agriculture in the ITA and ITA2 as well as the potential benefits of a product expansion through an ITA3. In the interests of inclusiveness, particular attention should be paid to products of interest to developing countries, especially technologies and products that may benefit smallholders.

  We also propose that subsequent workshops/informal meetings be organised for other sectors, including but not limited to the ones studied in this report, i.e., renewable energy, medical technology, and recycling and waste management.

- **Businesses should increase their commitment to identifying products suitable for liberalisation in a future ITA3**
  The involvement of more businesses worldwide will be essential, as more work needs to be done to identify products for inclusion in a future ITA 3. In this report, we have only been able to cover a small part of the rapidly changing digital landscape in which international trade exists. We encourage the participation of companies, producers, exporters, importers and users operating in relevant sectors as well as business organisations. Once more products have been identified, a subsequent

dialogue with trade policy makers will be highly relevant in view of the imminent MC14. Who will be the first to pick up the baton?

- **Provide capacity building and technical support to developing countries**
  To ensure the inclusiveness of ITA discussions, capacity building and technical assistance could be offered to developing countries now, before any negotiations begin on an ITA3 regarding which products to include and staging periods. These discussions could be conducted between the EU and African countries, for example within the framework of the Africa-EU Partnership.

- **Raise awareness and encourage more WTO members to become participants in the ITA and/or ITA2**
  Our analysis also reveals that several ICT products with important applications in agriculture, renewable energy, medical technology, and recycling/waste management are already covered by the ITA or ITA 2. It is therefore important to continue to raise awareness on the benefits of ITA and ITA2, including on how participation can mitigate various aspects of the digital divide.

  One suggestion is that the WTO Secretariat should continue with its thematic workshop on ITA and Digital Transformation. These workshops are an opportunity for both participating and non-participating developing countries to enhance their understanding of the ITAs. They are also an opportunity to elaborate on the long-term benefits of participation, including attracting foreign direct investment (FDI) and links between ITA participation, digital infrastructure and e-commerce, as well as addressing the potential short-term challenges.[93]

- **Address barriers to trade in indispensable services**
  The sale of products and services is deeply intertwined in many sectors and especially in high-tech sectors such as renewable energy and medical technology manufacturers often package products with services, including presale and after-sales service. A customer might not even be interested in the product without the accompanying services, the services are thus considered *indispensable services*.[94, 95]

  To fully realise the benefits of any new zero-tariff agreement on ITA products, barriers to trade in services must also be addressed. Trade in indispensable services covers all modes of supply, with the movement of natural persons and cross-border trade being especially important. Being able to move both data and qualified personnel swiftly and easily across borders is essential to the functioning and maintenance of many high-tech products.

93 First Geneva-based thematic training course on the ITA and Digital Transformation took place in March 2023.
94 National Board of Trade Sweden (2020).
95 National Board of Trade Sweden (2014).

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Appendix 1. Participants in the Information Technology Agreements

ITA participants	ITA	ITA 2
Afghanistan	Yes	No
Albania	Yes	Yes
Australia	Yes	Yes
Bahrain, Kingdom of	Yes	No
Canada	Yes	Yes
China	Yes	Yes
Colombia	Yes	Yes
Costa Rica	Yes	Yes
Dominican Republic	Yes	No
Egypt	Yes	No
El Salvador	Yes	No
EU27	Yes	Yes
Georgia	Yes	No
Guatemala	Yes	Yes
Honduras	Yes	No
Hongkong, China	Yes	Yes
Iceland	Yes	Yes
India	Yes	No
Indonesia	Yes	No
Israel	Yes	Yes
Japan	Yes	Yes
Jordan	Yes	No
Kazakhstan Republic of	Yes	No
Korea, Republic of	Yes	Yes
Kuwait, The State of	Yes	No
Kyrgyz Republic	Yes	No
Lao PDR	Yes	Yes
Macao, China	Yes	No
Malaysia	Yes	Yes
Mauritius	Yes	Yes
Moldova, Republic of	Yes	No
Montenegro	Yes	Yes
Morocco	Obligations not fulfilled	No
New Zealand	Yes	Yes
Nicaragua	Yes	No
Norway	Yes	Yes
Oman	Yes	No
Panama	Yes	No
Peru	Yes	No
Philippines	Yes	Yes
Qatar	Yes	No
Russian Federation	Yes	No
Saudi Arabia, Kingdom of	Yes	No

ITA participants	ITA	ITA 2
Seychelles, Republic of	Yes	No
Singapore	Yes	Yes
Switzerland (and on behalf of Liechtenstein)	Yes	Yes
Chinese Taipei	Yes	Yes
Tajikistan	Yes	No
Thailand	Yes	Yes
Timor-Leste*	Yes	Yes
Turkey	Yes	No
Ukraine	Yes	No
United Arab Emirates	Yes	No
United Kingdom	Yes	Yes
United States	Yes	Yes
Vietnam	Yes	No

Source: WTO (2022)

* WTO member in 2024. Participation to the ITAs approved in October 2023.

Appendix 2. Examples of products which could be of interest for an upcoming ITA3

HS 2022	Product – short description	Description of use, for example
250410	Natural graphite	Input for batteries
380110	Artificial graphite	Input for batteries
exCh.61	Smart clothes	Med tech
exCh.62	Smart clothes	Med tech
exCh.64	Smart shoes	Med tech
841912	Solar water heaters	Healthcare settings and other sectors
ex842119	Centrifuges used in laboratories	Med tech
842121	Filtering or purifying machinery for water	Industry
842870	Other lifting, handling, loading or unloading machinery – industrial robots	Industry/Agri/Med tech
ex842890	Telepresence robots	Healthcare and other sectors
ex843410	Milking robots	Agri
ex843420	Dairy machinery robots	Agri
843490	Parts for milking robots & dairy machinery	Agri
ex8436	Agriculture robotics & parts	Agri
ex8476	Reverse vending machines	Recycling/waste management
847950	Industrial robots, not elsewhere specified or mentioned	Industry/Agri/Med tech
ex8479	Reverse vending machines	Recycling/waste management
ex8479	Medication robots	Med tech
854420	Coaxial cable and other coaxial cable conductors	Industry/Renewable energy
848510	Machines for additive manufacturing, – by metal deposit (i.e. 3D printing)	Industry/Agri/Med tech/ Renewable energy
848520	Machines for additive manufacturing, – by plastic or rubber deposit (i.e 3D printing	Industry/Med tech
848530	Machines for additive manufacturing, – by plaster, cement or ceramic deposit (i.e 3D printing)	Industry/Renewable energy
848580	– Other – – Machines for additive manufacturing (i.e 3D printing)	Industry
848590	Parts (for 3D printing)	Industry/Agri/Med tech/ Renewable energy
850171	Photovoltaic DC generators	Renewable energy
850172	Photovoltaic DC generators	Renewable energy
850720	Electric accumulators, other lead-acid accumulators	Industry
850780	Photovoltaic AC generators	Renewable energy
850730	Electric accumulators, nickel-cadmium	Industry/Med tech
850750	Electric accumulators, nickel-metal hydride	Industry/Agri
850760	Electric accumulators, lithium-ion	Industry/Med tech /Renewable energy
850780	Other accumulators	Industry/Agri
850790	Parts (for accumulators)	Industry
852872	Reception apparatus for television, whether or not incorporating radio-broadcast receivers or sound or video recording or reproducing apparatus, other colour	Med tech
853670	Connectors for optical fibres and optical bundles or cables	Industry

HS 2022	Product – short description	Description of use, for example
853710	Boards, panels, consoles, desks, cabinets and other bases, equipped with two or more apparatus of heading 8535 or 8536, for electric control or the distribution of electricity, including those incorporating instruments or apparatus of Chapter 90, and numerical control apparatus, for a voltage not exceeding 1 000 V	Industry/Renewable energy
ex853710	Home chargers for electrical vehicle cars (EV-cars)	Renewable energy
853720	Boards, panels, consoles, desks, cabinets and other bases, equipped with two or more apparatus of heading 8535 or 8536, for electric control or the distribution of electricity, including those incorporating instruments or apparatus of Chapter 90, and numerical control apparatus, for a voltage exceeding 1000 V	Industry/Renewable energy
ex853890	Parts suitable for use solely or principally with the apparatus of heading 8535, 8536 or 8537	Industry/Renewable energy
853951	Light-emitting diode (LED) modules	Renewable energy
853952	Light-emitting diode (LED) lamps	Med tech
ex853952	Ultra-violet LED lamps	Agri/Med tech/Renewable energy
ex853990	Parts for Light-emitting diode (LED) light sources	Renewable energy
ex854370	Ultra-violet irradiation equipment for disinfection purpose (robot)	Used in hospitals etc
880621	Unmanned aircrafts (drones) – other for remote-controlled flight only, – – with maximum take-off weight not more than 250g	Agri/Med tech/Industry
880622	Unmanned aircrafts (drones) – other for remote-controlled flight only, – – with maximum take-off weight more than 250g but not more than 7kg	Agri/Med tech/Industry/ Renewable Energy/ Waste management
880623	Unmanned aircrafts (drones) – other for remote-controlled flight only, – – with maximum take-off weight more than 7kg but not more than 25kg	Agri/Med tech/Industry/ Renewable Energy/ Waste management
880624	Unmanned aircrafts (drones) – other for remote-controlled flight only, – – with maximum take-off weight more than 25kg but not more than 150kg	Agri/Med tech/Industry/ Renewable Energy/ Waste management
880629	Unmanned aircrafts (drones) – other for remote-controlled flight only, – – Other	Agri/Med tech/Industry/ Renewable Energy/ Waste management
900110	Optical fibres	Industry
ex900630	Cameras for medical or surgical examination of internal organs	Med tech
ex900490	VR headsets	Med tech
903210	Thermostats	Agri/Med tech/Industry/ Renewable Energy
ex9102*	Smart watch	Med tech
Needs to be further identified	Semiconductor manufacturing equipment or materials as well as parts	Agri/Med tech/Industry/ Renewable Energy

* Certain smartwatches are classified under 8517 and covered by ITA

Appendix 3. Applied MFN-tariffs on certain goods

HS 2022	Short description	EU	Bangladesh	Brazil	China	India	Kenya	Nigeria	US
841912	Solar water heaters	2.6%	0%	16%	5%	10%	0%	5%	0%
842870	Industrial robots for lifting, handling, loading or unloading	0%	1%	11.2%	5%	7.5%	0%	5%	0%
843410	Milking robots	0%	1%	11.2%	4%	7.5%	0%	5%	0%
843680	Other agricultural machinery	1.7%	1%	11.2%	8%	7.5%	0%	5%	0%
847950	Industrial robots, not elsewhere specified or mentioned	1.7%	1%	11.2%	0%	7.5%	0%	5%	2.5%
848510	Machines for additive manufacturing (3D) – by metal deposit	2.7%	1%	11.2%	9%	7.5%	0%	10%	2.5%
848520	Machines for additive manufacturing (3D) – by plastic or rubber deposit	1.7%	1%	11.2%	5%	7.5%	0%	10%	3.1%
848530	Machines for additive manufacturing (3D) – by plaster, cement, ceramic or glass etc.	0%/1.7%	1%	11.2%	5%/8%	7.5%	0%	10%	2.5%
848580	– Other – – Machines for additive manufacturing (3d)	0%/1.7%	1%	11.2%	0%/9%/ 12%	7.5%	0%	10%	2.5%
850171	– Photovoltaic DC generators – – of an output not exceeding 50 W	2.7%	1%	14.4%	12%	15%	0%	5%	2.5%
850172	– Photovoltaic DC generators – – of an output exceeding 50 W	2.7%	1%	11.2%/ 14.4%	5%/10%/ 12%	15%	0%	5%	2%/ 2.5%
850180	– Photovoltaic AC generators	2.7%	1%	11.2%	5.5%/6%/ 10%	10%	0%	5%	2.4%/ 2.5%
850730	Electric accumulators, nickel-cadmium	2.6%	25%	14.4%/18%	10%	15%	25%	20%	2.5%
850750	Electric accumulators, nickel-metal hydrade	2.7%	25%	0%/18%	10%	15%	25%	20%	3.4%
850760	Electric accumulators, lithium-ion	0%/2.7%	25%	18%	10%	20%	25%	20%	3.4%
850780	Other accumulators	0%/2.7%	10%/25%	18%	10%	15%	25%	20%	3.4%
853710	Boards, panels, consoles, desks, cabinets and other bases, equipped with two or more apparatus of heading 8535 or 8536, for electric control or the distribution of electricity, including those incorporating instruments or apparatus of Chapter 90, and numerical control apparatus, for a voltage not exceeding 1 000	2.1%	1%/10%	0%/ 11.2%/ 18%	1%-8%	15%	10%	5%	0%/ 2.7%
853720	Boards, panels, consoles, desks, cabinets and other bases, equipped with two or more apparatus of heading 8535 or 8536, for electric control or the distribution of electricity, including those incorporating instruments or apparatus of Chapter 90, and numerical control apparatus, for a voltage exceeding 1 000 V	2.1%	10%	0%/14.4%	8%	15%	0%	5%	2.7%
853951	Light-emitting diode (LED) modules	2.7%	15%	9.6%	6%	10%	25%	20%	0%
853952	Light-emitting diode (LED) lamps	3.7%	15%	9.6%	8%	20%	25%	20%	2%

Source: Access2Markets, European Commission (June, 2023)

Sammanfattning på svenska

Summary in Swedish

Informationsteknikavtalet anses vara ett av WTO:s mest framgångsrika plurilaterala avtal. Det har lett till tullfrihet för alla varor som omfattas av avtalet på mest-gynnad nations basis vid import i de länder som deltar i avtalet och, utan krångliga ursprungsregler. Utvidgningen av Informationsteknikavtalet, även kallat ITA2, är även det ett framgångsrikt avtal även om antalet deltagande länder är betydligt färre jämfört med det ursprungliga avtalet. Den digitala utvecklingen går oerhört fort på detta område och det är därför relevant att analysera behovet av tullfrihet för fler varor genom ett ITA3.

Syftet med denna rapport är att undersöka om ett möjligt ITA3 kan bidra till spridning av digital teknik för att främja handel och bidra till de globala hållbarhetsmålen. Genom att lyfta fram ett antal exempel på varor som kan inkluderas i ett ITA3 är ambitionen att väcka intresse för frågan inför kommande ministermöten i WTO och bidra till en diskussion om vilka varor som kan vara relevanta att inkludera samt ge förslag på vägar framåt för att få i gång en sådan diskussion. Vi har valt att begränsa oss till följande områden där ökad användning av digital teknik kan bidra till ökad hållbarhet: jordbruk, medicinsk utrustning, förnybar energi samt återvinning.

Vi har identifierat varor som skulle kunna ingå i ett ITA3, exempelvis 3D-printers, olika robotar samt drönare[96] se Appendix 2 för fler exempel.

Det finns flera steg som kan vidtas för att väcka intresse och främja konstruktiva diskussioner om ett ITA3. Vi har därför följande rekommendationer:

- Vi föreslår att frågan om en utökning av produkter och därmed i förlängningen ett ITA3, tas upp för diskussion vid nästkommande möte(n)[97] i WTO:s ITA-kommitté i Genève. Ett förslag från EU kan bidra till att detta sker.
- Branschorganisationer och företag (producenter/exportörer/importörer samt användare) på bred front, runt om i världen, bör förstärka sitt engagemang att undersöka möjligheten till ett ITA3 och vilka varor som borde ingå. Här ser vi att det finns behov av inkluderande arbetsmöten för att komma vidare.
- Ett sätt att väcka intresse för ett ITA3 är att utforska möjligheterna att använda detta som ett verktyg för underlätta handel med varor som kan bidra till de globala hållbarhetsmålen. Ett första steg skulle kunna vare en workshop i WTO om digitala verktyg som används i jordbrukssektorn.
- Kapacitetsstöd och teknisk assistans kommer att behövas till utvecklingsländer om förhandlingar om ett ITA3 skulle komma i gång så att de kan delta aktivt redan innan nya förhandlingar påbörjas.
- Vi konstaterar också att flera varor som är viktiga för jordbruk, förnybar energi, medicinteknik samt återvinning redan omfattas av antingen ITA1 eller ITA2. Det är därför viktigt att fortsätta öka medvetenheten om de befintliga avtalen bland WTO-medlemmar som inte har anslutit sig till dessa avtal.
- Varor och tjänster blir mer och mer sammanlänkade, exempelvis IoT. För att dra nytta av tulliberaliseringar för ITA behöver man även tackla de hinder som finns på tjänstehandelsområdet, särskilt vad gäller dataflöden men även personrörlighet.

96 Vissa varor, exempelvis drönare skulle dock kunna klassas som produkter med dubbla användningsområden som kan användas både civilt och även militärt.

97 ITA-kommittén brukar hålla 2 möten/år på våren och på hösten.

The National Board of Trade Sweden is the government agency for international trade, the EU internal market and trade policy. Our mission is to facilitate free and open trade with transparent rules as well as free movement in the EU internal market.

Our goal is a well-functioning internal market, an external EU trade policy based on free trade and an open and strong multilateral trading system.

We provide the Swedish Government with analyses, reports and policy recommendations. We also participate in international meetings and negotiations.

The National Board of Trade, via SOLVIT, helps businesses and citizens encountering obstacles to free movement. We also host several networks with business organisations and authorities which aim to facilitate trade.

As an expert agency in trade policy issues, we also provide assistance to developing countries through trade-related development cooperation. One example is Open Trade Gate Sweden, a one-stop information centre assisting exporters from developing countries in their trade with Sweden and the EU.

Our analyses and reports aim to increase the knowledge on the importance of trade for the international economy and for global sustainable development. Publications issued by the National Board of Trade only reflect the views of the Board.

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