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ENHANCING TRANSPARENCY AND TRACEABILITY FOR SUSTAINABLE VALUE CHAINS IN GARMENT AND FOOTWEAR

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DRAFT

66 **I. Recommendation n°46:**  
 67 **Enhancing transparency and traceability for sustainable**  
 68 **garment and footwear value chains**

69 **A. Introduction**

70 1. Improving traceability and transparency has become a priority for the garment and  
 71 footwear industry. Consumers, governments and civil society are demanding responsible  
 72 business conduct and are calling upon the industry to identify and address actual and potential  
 73 impacts in the areas of human rights violations, adverse environmental effects, and human  
 74 health hazards.

75 2. By creating enhanced visibility in value chains, companies are better equipped to manage  
 76 such impacts, and address financial, operational and reputational risks. Also, more  
 77 transparent value chains allow companies to respond more effectively to unforeseen  
 78 disruptions, conform with applicable laws and regulations, ensure product quality and safety,  
 79 combat counterfeits, and protect cultural and industrial heritage.

80 3. On the other side, greater transparency empowers consumers to make better informed  
 81 consumption choices, as they have more reliable information about the sustainability and  
 82 circularity claims of products and processes. As a result, traceability and transparency have  
 83 a strong potential to build trust among all industry actors.

84 4. High, low and middle-income countries as well as those with economies in transition are  
 85 deeply involved in the global garment and footwear trade and all have a key role in advancing  
 86 the industry's sustainable production and consumption patterns in line with the 2030 Agenda  
 87 for Sustainable Development and, particularly, its Goal 12 on Responsible Consumption and  
 88 Production.<sup>1</sup>

89 5. At the same time, their roles tend to be differentiated. High-income countries tend to  
 90 operate more in the downstream part of the value chain where there is greater capital  
 91 investment and more consumer-linked activities (design, branding and retailing,  
 92 consumption, and post-consumption activities). Low-, middle-income and transition-  
 93 economy countries tend to mainly intervene in the upstream part of the value chain, where  
 94 there are more labour-intensive activities (farming, harvesting, ginning, spinning, dyeing,  
 95 weaving, stitching, tanning, cutting and finishing).

96 6. Because of their nature and socioeconomic context, it is in these upstream manufacturing  
 97 activities that most sustainability hotspots are concentrated, and where industry actors face  
 98 most of the challenges in identifying, preventing and mitigating them. On the other hand, it  
 99 is the downstream actors that often set the parameters and the financial incentives for  
 100 upstream actors. Indeed, it is the design, product specifications, contract clauses related to  
 101 payment terms, and withdrawal conditions that determine the margin of manoeuvre that  
 102 upstream actors have for providing decent working conditions and respecting the  
 103 environment.

104 7. As a result, effectively addressing risks to responsible business conduct depends on all the  
 105 links in the value chain and requires the active and effective engagement of both upstream  
 106 and downstream actors. The latter, who make the final decisions about which materials are  
 107 used and which products are placed on the market, also are expected – and at times, legally  
 108 required – to identify and mitigate risks that might result in harm to humans or the  
 109 environment throughout their entire value chain.

110 8. In this context, downstream actors must increase their knowledge of where fibres,  
 111 materials and all product parts and components come from, as well as how they are sourced,  
 112 processed and traded. At the same time, there is clear evidence that their actual capacity to  
 113 perform and manage activities in support of enhanced traceability and transparency is limited

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<sup>1</sup> Transforming our world: the 2030 Agenda for Sustainable Development  
 ([https://www.un.org/ga/search/view\\_doc.asp?symbol=A/RES/70/1&Lang=E](https://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E) accessed on 2020-04-22).

114 and that their digital skills and capabilities to collect and elaborate data, need to be further  
 115 developed. In order to be effective, optimize scale and create efficiencies, actions to improve  
 116 traceability and transparency in garment and footwear value chains must be sector-wide and  
 117 encompass globally scattered actors.

118 9. Moving beyond production and marketing activities, traceability and transparency are  
 119 enablers that can guarantee circularity claims. As such, they can support the shift from linear  
 120 economic models that take resources, make products and dispose of waste (“take-make-  
 121 waste”), towards circular economic models that Reduce the new resources used, Reuse  
 122 products and parts, and Recycle waste (“the 3Rs model”). The aim is to obtain the maximum  
 123 value from resources, leveraging zero-waste design, product-life extension, resource  
 124 efficiency, repairing and remanufacturing services.

The following definitions of key concepts are used in this Policy Recommendation:

**Traceability** is understood as “the ability to trace the history, application or location of an object” in a supply chain (ISO 9001:2015). In this context, it is defined as the ability to “identify and trace the history, application, location and distribution of products, parts and materials, to ensure the reliability of sustainability claims, in the areas of human rights, labour (including health and safety), the environment and anti-corruption” (United Nations Global Compact 2014);<sup>2</sup> and “the process by which enterprises track materials and products and the conditions in which they were produced through the supply chain” (OECD, 2018).<sup>3</sup>

**Transparency** relates directly to relevant information being made available to all elements of the value chain in a harmonized way, which allows common understanding, accessibility, clarity and comparison (European Commission, 2017).

**Sustainability**<sup>4</sup> In the context of garment and footwear value chains, means that all activities, throughout a product’s life cycle, take into account their environmental, health, human rights and socio-economic impacts, and their continuous improvement (UNECE 2019).

**Due diligence** is understood as “the process through which enterprises can identify, prevent, mitigate and account for how they address their actual and potential adverse impacts” (OECD 2018) as an integral part of business decision-making and risk management systems (OECD, 2018).<sup>5</sup>

**Circularity** of a production process refers to the ability of such process to retain the value of products, materials and resources in the economy for as long as possible

<sup>2</sup> United Nations Global Compact Office (2014), ‘A Guide to Traceability A Practical Approach to Advance Sustainability in Global Supply Chains’. Available at: [https://d306pr3pise04h.cloudfront.net/docs/issues\\_doc%2Fsupply\\_chain%2FTraceability%2FGuide\\_to\\_Traceability.pdf](https://d306pr3pise04h.cloudfront.net/docs/issues_doc%2Fsupply_chain%2FTraceability%2FGuide_to_Traceability.pdf)

<sup>3</sup> OECD (2018), ‘OECD Due Diligence Guidance for Responsible Supply Chains in the Garment and Footwear Sector’, OECD Publishing, Paris. Available at: <http://dx.doi.org/10.1787/9789264290587-en>

<sup>4</sup> United Nations, 2015 (A/RES/70/1) Transforming our world: the 2030 Agenda for Sustainable Development, [https://www.un.org/ga/search/view\\_doc.asp?symbol=A/RES/70/1&Lang=E](https://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E) (accessed 24-06-2020), where sustainability refers to the ability of an activity to support “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. This implies that the activity also takes into due account the needs of “People, Planet, Prosperity, Peace and Partnership” as outlined in the United Nations Sustainable Development Goals.

<sup>5</sup> OECD (2018), ‘OECD Due Diligence Guidance for Responsible Supply Chains in the Garment and Footwear Sector’, OECD Publishing, Paris (accessed on 2020-04-22). Available at: <http://dx.doi.org/10.1787/9789264290587-en>

and to minimise to the extent possible the generation of waste along all the steps of the value chain (European Commission, 2015).<sup>6</sup>

125 10. This Policy Recommendation responds to the increasing demand for policy and  
 126 legislative action for responsible business conduct in global value chains. It seeks to support  
 127 measurable sustainability efforts and targets in order to identify, prevent and mitigate adverse  
 128 impacts on people and the planet entailed by corporations through their operations and third-  
 129 party business relations, Thus, this Recommendation aims at reducing the imbalance between  
 130 upstream and downstream actors, as well as enhancing the human dignity, quality of life and  
 131 empowerment of garment and footwear workers.

132 11. The measures and approaches recommended here are aligned with: the relevant  
 133 Sustainable Development Goals (SDGs) of the United Nations Agenda for Sustainable  
 134 Development 2030; the United Nations Guiding Principles on Business and Human Rights;<sup>7</sup>  
 135 the International Labour Organization’s (ILO) Declaration on Fundamental Principles and  
 136 Rights at Work, relevant ILO Conventions and Recommendations, and the ILO Tripartite  
 137 Declaration on Principles concerning Multinational Enterprises and Social Policy; the Paris  
 138 Agreement on Climate Change; the Convention on Illegal Trade of Endangered Species  
 139 (CITES); the Organization for Economic Cooperation and Development (OECD) Guidelines  
 140 for Multinational Enterprises,<sup>8</sup> and the OECD Due Diligence Guidance for Responsible  
 141 Supply Chains in the Garment and Footwear Sector.<sup>9</sup>

## 142 B. Scope

143 12. This Policy Recommendation is relevant for all countries and companies participating  
 144 in global value chains for garment and footwear, from raw materials production and  
 145 processing, through manufacturing to finished product branding and retailing, consumption  
 146 and post-consumption activities.

147 13. Areas where action to advance the traceability and transparency of value chains is  
 148 needed include:

- 149 • Awareness of the indispensable role that traceability and transparency play in the  
 150 identification, prevention, mitigation and remediation of potential and actual adverse  
 151 environmental, social and ethical risks to responsible business conduct by companies  
 152 and their global business partners throughout the entire value chain. This also applies  
 153 to suppliers that are more at risk of remaining hidden like subcontracted, informal and  
 154 small producers.
- 155 • Development, implementation and enforcement of supporting government policy,  
 156 legislation and practices, including the integration of traceability and transparency  
 157 information into public purchasing practices in order to better inform the work of  
 158 buying and compliance offices.
- 159 • Incorporation of traceability and transparency into the analysis supporting risk-based  
 160 management of value chains, and into the reporting on efforts to address sustainability  
 161 risks based upon relevant norms and standards.

<sup>6</sup> European Commission (2015), European Circular Economy Package of the European Commission, Communication ‘Closing the loop – An EU action plan for the Circular Economy’, COM(2015) 614 final.

<sup>7</sup> UNHR ,UN Guiding Principles on Business and Human Rights ([https://www.ohchr.org/Documents/Publications/GuidingPrinciplesBusinessHR\\_EN.pdf](https://www.ohchr.org/Documents/Publications/GuidingPrinciplesBusinessHR_EN.pdf) accessed on 2020-04-22)

<sup>8</sup> OECD Guidelines for Multinational Enterprises ([www.oecd.org/daf/inv/mne/48004323.pdf](http://www.oecd.org/daf/inv/mne/48004323.pdf) accessed on 2020-04-22)

<sup>9</sup> ILO Tripartite Declaration on Principles concerning Multinational Enterprises and Social Policy [https://www.ilo.org/wcmsp5/groups/public/---ed\\_emp/---emp\\_ent/---multi/documents/publication/wcms\\_094386.pdf](https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/---multi/documents/publication/wcms_094386.pdf)

- 162 • Engagement of enterprises in long-term relationships based on their mutual adherence  
163 to the United Nations Sustainable Development Goals, and adoption of a more  
164 proactive vision by value-chain leaders for the implementation of incentives to  
165 encourage continuous improvement in traceability and transparency for sustainability  
166 in sector activities.
- 167 • Promotion of sustainable consumption, encouraging consumers to better understand  
168 their role and take action, based on product information that comes from traceability  
169 and transparency activities. This should apply during the purchase, re/use and  
170 disposal of products in order to reduce potential negative impacts and effects on  
171 society, human health and the environment, and to support the circular economy.
- 172 • Development and promotion of a common supporting framework across the entire  
173 sector and of guidance on the implementation of traceability and transparency for all  
174 industry stakeholders.
- 175 14. The last of the above needs to support the design of traceability and transparency  
176 systems for rapid and effective information exchange that allow value-chain actors to take  
177 targeted actions based on their goals for supporting sustainable development and related,  
178 risk-based priorities.
- 179 15. At the same time, such systems need to be underpinned by a set of common, agreed  
180 rules which take into account their implementation costs and the capacities of all actors  
181 involved as well as building the trust needed for sharing data. They also need to be practical  
182 and allow for the use of appropriate implementation technologies by facilities of varying  
183 sizes and technological capabilities, including farmers and small businesses.

#### 184 **C. Target audience**

- 185 16. This Recommendation offers a basis for action by both public-sector policymakers and  
186 private-sector decision makers who wish to advance due diligence, sustainability, and  
187 circularity approaches.
- 188 17. The Recommendation can also serve as a reference for other industry stakeholders in  
189 their efforts to support the uptake and implementation of the recommended measures,  
190 including:
- 191 • Business and industry associations
  - 192 • Consumers and consumer associations
  - 193 • Intergovernmental Organizations
  - 194 • Investors/shareholders
  - 195 • Local authorities
  - 196 • Non-governmental organizations (NGOs)
  - 197 • Scientific and technological community
  - 198 • Workers and trade unions

#### 199 **D. Purpose and Benefits**

- 200 18. This Recommendation responds to the call from industry stakeholders for government  
201 action in support of:
- 202 • Greater awareness by government, industry and the public of the benefits provided  
203 by traceability and transparency for due diligence, sustainability and circularity.
  - 204 • A level playing field where industry actors will benefit from a competitive advantage  
205 when they invest and take action to enhance traceability and transparency in their  
206 value chains in support of due diligence and sustainability.

- 207 • More efficient ways for workers and consumers to access remedies for human rights  
208 violations and value chain disruptions.
- 209 • A globally recognized and harmonized approach for collecting, exchanging and  
210 validating information for traceability and transparency in the sector’s value chains.
- 211 • The use of standard data definitions and codes to facilitate the exchange of  
212 information (semantic interoperability) between IT systems that support traceability  
213 and transparency in the sector’s value chains.
- 214 • The fight against product counterfeiting, fraud and illegal trade in protected species  
215 through the identification of origin – which means provenance and location of all  
216 products, parts, components, processes and factories – and local content.

217 19. The final objective of this Recommendation is to establish a mechanism that enables  
218 governments, industry partners, consumers and all other relevant stakeholders to take risk-  
219 informed decisions, overcome information asymmetry, communicate and achieve  
220 accountability for sustainability claims that go beyond regulatory compliance, and anchor  
221 business models to responsible business conduct.

222 20. It does so by providing industry and other relevant stakeholders with a set of  
223 internationally agreed practices for the harmonized collection and transmission of data for  
224 tracking and tracing materials, products and processes across an entire value chain including  
225 all involved facilities and intermediaries as well as related information about the  
226 sustainability performance of these value-chain participants. This will help to ensure the  
227 reliability of sustainability claims in the areas of human rights, fair labour practices, the  
228 environment, consumer interests and anti-corruption, while also allowing simplification,  
229 cost-efficiency and improved organizational processes, especially for SMEs and industry  
230 actors in less-advanced economies.

231 21. The Recommendation includes implementation Guidelines which assist policy and  
232 decision makers in better understanding tracking and tracing while also providing a  
233 framework for implementation by all stakeholders in garment and footwear value chains. The  
234 annexed Call to Action provides a mechanism to monitor and keep track of implementation  
235 of the recommended measures, and to facilitate the exchange of good practices and lessons  
236 learned.

## 237 **E. Challenges**

238 22. Tracking and tracing in garment and footwear value chains is a multifaceted effort and  
239 a challenging task due to the organizational and technological complexities of the business  
240 networks in this industry, which often make it difficult for companies to track a product’s  
241 history and attributes back to its origins.

242 23. The maintenance of data privacy and security is a critical aspect, and is of particular  
243 concern for brands, traders, and companies in the high-value segment of the market who  
244 often consider information about specialized providers to be an important competitiveness  
245 factor. In addition, there are challenges around ensuring that data systems are secure for all  
246 users.

247 24. The reliability and authenticity of data shared as well as the strength of the controls  
248 validating materials, products and production processes, and of the proofs showing  
249 compliance with sustainability requirements, are also important issues. In the context of  
250 traceability, models with less stringent controls, for example around the handling of certified  
251 and non-certified materials, are often less complex and, thus, less expensive.

252 25. In addition, the implementation of traceability and transparency requires substantial  
253 investments in systems and technologies aimed at performing various levels of verification  
254 of processes, products, parts and components at all stages of the value chain and related data  
255 entry and product labelling. In this connection, technological barriers are also a concern.  
256 Technological advances such as blockchain and distributed ledger technologies, bar codes  
257 and RFID tags offer an opportunity, but mastering these technologies may be difficult, due  
258 to geographical and language barriers as well as costs and available infrastructure. In



259 addition, coordination between different supply chain actors requires time and willingness  
 260 on all sides. These costs are a concern for many actors pursuing traceability, and especially  
 261 for non-vertically integrated companies, brands and SMEs.

262 26. Alignment around tools, as proposed in this Recommendation and its accompanying  
 263 Guidelines, helps to reduce costs for individual actors. When leadership is there and  
 264 collaboration is widespread, there is greater incentive for actors to work together, which  
 265 improves results, lowers costs overall – and thus helps to address the above challenges.

## 266 **F. Recommendation**

267 27. The United Nations Centre for Trade Facilitation and Electronic Business  
 268 (UN/CEFACT) of the United Nations Economic Commission for Europe (UNECE), at its  
 269 twenty seventh session, agreed to recommend that Governments act in the following action  
 270 areas:

### 271 **Policy Actions, Norms and Standards**

272 (a) Establish harmonized policies and regulations that support the implementation of  
 273 traceability and transparency, in order to achieve higher environmental and social standards,  
 274 economic viability and circularity in garment and footwear value chains by:

275 (i) Encouraging responsible business conduct, which addresses actual and potential  
 276 adverse impacts resulting from companies' decisions

277 (ii) Ensuring the reliability of non-financial reporting and sustainability claims about  
 278 materials, products, processes and facilities

279 (iii) Contributing to international policy coherence, thus addressing the challenges, for  
 280 both producers and consumers, that are created by a proliferation of similar, but  
 281 different, policies and regulations, as well as establishing a more level playing field  
 282 for companies operating in this industry.

283 (b) Define minimum levels of traceability across garment and footwear value chains, from  
 284 raw materials sourcing to consumption and post-consumption activities, and the minimum  
 285 data that needs to be collected in order to show due diligence and transparency in support of  
 286 claims regarding the origin, quality and other characteristics, including sustainability  
 287 performance of products, processes and facilities.

288 (c) Encourage companies' efforts to embrace higher transparency in value-chain operations,  
 289 for example by disclosing the names and addresses of suppliers' factories and sharing  
 290 relevant information on their sustainability performance with stakeholders who are impacted,  
 291 or potentially impacted, by enterprise decisions. This should be done in a timely, culturally  
 292 sensitive and accessible manner, in line with international data protection norms and  
 293 standards.

294 (d) Reduce the implementation burden on business and support SMEs by promoting the use  
 295 of international standards, such as the UN/CEFACT standard for traceability and  
 296 transparency of sustainable value chains in garment and footwear or the equivalent, and by  
 297 encouraging the use of existing data. For example, requiring the use of these standards for  
 298 any mandatory reporting requirements linked to traceability results such as showing that  
 299 materials were legally sourced or no forced labour was used.

### 300 **Incentives**

301 (e) Provide economic and fiscal incentives (positive and negative) for establishing and  
 302 implementing value-chain traceability and transparency systems, especially in support of  
 303 SMEs, small farmers and producers, and other vulnerable groups such as women, young  
 304 workers, home-based workers and migrant workers

305 (f) Provide non-financial incentives, including measures to facilitate access to markets, fast-  
 306 track processes, public procurement criteria that are green and socially responsible,

307 specialized managerial and workforce training, public visibility, peer-learning and non-  
308 financial reporting requirements.

309 **Research & Development**

310 (g) Support research and development, and identify and scale-up innovative solutions for:

311 (i) Tracing and verifying products' authenticity and provenance

312 (ii) Advancing the sustainability and circularity of production and consumption  
313 processes

314 (iii) Increasing the lifespan of products

315 (iv) Creating more sustainable materials and

316 (v) Recycling garments and textiles.

317 **Awareness & education**

318 (h) Provide education in order to:

319 (i) Allow consumers to make informed choices

320 (ii) Create an awareness of the shared responsibility of all stakeholders including both  
321 business and consumers in preserving our planet, and

322 (iii) Increase the demand for materials, products and processes that are more  
323 responsible and sustainable.

324 **Multi-stakeholder collaborative initiatives**

325 (i) Stimulate and support multi-stakeholder, collaborative initiatives that seek to achieve  
326 industry-wide change and create shared value for all industry actors. These should be  
327 inclusive, benefitting especially SMEs and vulnerable groups in developing and transition  
328 countries while, at the same time, addressing garment and footwear value chains'  
329 sustainability risks and impacts. Such initiatives could include:

330 (i) A global, open-source knowledge platform to make guidance available and ensure  
331 that industry actors receive appropriate training and information

332 (ii) Multi-stakeholder policy dialogues for the sharing of good practices and lessons  
333 learned at international, regional and national levels

334 (iii) Pilot projects to experiment with innovative approaches and advanced  
335 technologies in traceability, including blockchain, artificial intelligence (AI), Internet  
336 of things (IoT), and biotechnology markers to ensure an effective connection between  
337 digital and physical assets.

338 28. When deciding upon specific public policy actions to be taken, multi-stakeholder  
339 consultations are recommended in order to strike a balance between the different interests at  
340 stake, and to identify targeted implementation support for vulnerable groups. Special  
341 attention needs to be given to SMEs, smallholders and farmers, and other groups affected by  
342 unfair practices in this sector, including, as appropriate, women, young workers, home-based  
343 workers and migrant workers.

344 29. In order to monitor and keep track of the implementation of this Policy  
345 Recommendation, Governments are requested to report on commitments to the  
346 recommended measures starting from 2022, and thereafter, every two years. Such pledges  
347 are to be expressed in accordance with the annexed Call to Action, which is open to all  
348 industry stakeholders and actors embracing transformational change for a responsible and  
349 sustainable garment and footwear industry of the future.

350

351

352 **II. Guidelines for Recommendation n°46 on enhancing**  
353 **transparency and traceability for sustainable garment and**  
354 **footwear value chains**

355 **A. Introduction**

356 30. These Guidelines aim to assist policy and decision makers who wish to put in place or  
357 encourage recommended approaches for enhancing the traceability and transparency of  
358 sustainable and circular value chains in the garment and footwear industry.

359 31. *Traceability* is an essential requirement for creating transparency. It allows to identify  
360 where “assets” are as they move through a value chain. Then, when you have a final product,  
361 it can allow you to identify all of the “assets” that were used to make that product, their origin  
362 and characteristics, and the way they have been processed and transformed

363 32. *Transparency* requires companies to know what is happening upstream in the value  
364 chain, and to communicate this knowledge to both internal and external stakeholders. This  
365 knowledge includes where, by whom, how and when the product is made. Indeed, more and  
366 more consumers are insisting upon value-chain transparency for the products they buy, and  
367 they also tend to be willing to pay more for brands that provide this information.<sup>10</sup>

368 33. The surrounding ecosystem includes supporting policies, norms and standards,  
369 incentives, promotion, capacity building, and collaborative initiatives.

370 34. A *traceability system* together with its surrounding ecosystem forms a *traceability*  
371 *framework*.

372 35. The Recommendation and its Guidelines look at the planning and design of *traceability*  
373 *frameworks* across the entire value chain – from the production and processing of raw  
374 materials, through manufacturing to finished product branding and retailing, consumption  
375 and post-consumption activities. It covers

376 (a) The *guiding principles* for effective and efficient traceability in garment and  
377 footwear value chains.

378 (b) The *key components* of a *traceability system*, encompassing all the practical  
379 processes, procedures and technology that make up a functional system.

380 (c) *Cost allocation and incentive systems* as well as *creating inclusiveness* because  
381 the success of a system depends upon having the participation of all value-chain partners

382 (d) *The supporting role of advanced technologies* because they can improve the cost  
383 structure, operational effectiveness, and inclusiveness of traceability frameworks.

384 36. In annex to the Recommendation and these Guidelines, is a complementary *Roadmap*  
385 which presents a step-by-step approach for developing and implementing, from a practical  
386 standpoint, a traceability framework in support of sustainability, from both the industry and  
387 government perspectives.

388 37. Also in annex, a *Glossary* establishes a common understanding of the terms used across  
389 all of these documents.

390 **B. Traceability principles**

391 38. To develop and implement an efficient and effective traceability framework in the  
392 garment and footwear industry, a number of guiding principles should be taken into  
393 consideration:

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<sup>10</sup> Harvard Business Review, What Supply Chain Transparency Really Means, by Alexis Bateman and Leonardo Bonanni, 20 August 2019 <https://hbr.org/2019/08/what-supply-chain-transparency-really-means> (accessed on 16-05-2020).

394 (a) **Awareness:** Key stakeholders and industry actors need to be aware of the benefits  
395 of traceability systems in terms of enhanced regulatory compliance and corporate value.

396 (b) **Knowledge:** A clear understanding of the purpose of a traceability system, its  
397 scope, and the information needed in order to promote sustainability and circularity in  
398 production and consumption processes. This includes the information which should be  
399 collected and exchanged about the traceable asset (“what”), and how it has been transformed,  
400 moved or stored: i.e. by which actors (“by whom”), at which locations (“where”), in which  
401 processes (“why”), and at which time (“when”).

402 (c) **Risk-based analysis:** In order to maximise impact and make the best use of  
403 limited resources, traceability systems should be focussed on where there are risks of non-  
404 sustainable practices. These risk areas differ between products, value chains and geographic  
405 areas, so an in-depth risk analysis is needed at the start of the planning and implementation  
406 processes.

407 (d) **Commitment:** Policy and decision makers need to commit to traceability in the  
408 entire industry value chain – from the production and processing of raw materials, through  
409 manufacturing to finished product branding and retailing, to consumption and post-  
410 consumption activities, and such commitment must be embedded into policy and legal  
411 frameworks as well as corporate strategies for sustainability and circularity.

412 (e) **Engagement:** Traceability in the industry value chain requires a consensus  
413 approach and, therefore, engagement, buy-in and cooperation from a wide range of actors.  
414 To this end, the identification of their roles and the establishment of effective cooperation  
415 and collaboration mechanisms are essential. Due consideration should also be given to  
416 measures for supporting the participation of small actors, especially in emerging economies.

417 (f) **Structured implementation:** The implementation of traceability systems  
418 requires a high level of organization in the value chain, in order for assets or a groups of  
419 assets, to be identified (tagged), traced, and related information made available, preferably  
420 in an electronic format.

421 (g) **Norms and standards:** Traceability systems are of greatest value if they are  
422 implemented using relevant norms and standards, including for the data to be collected and  
423 exchanged. Therefore, implementation should be based on available, recognised norms and  
424 standards for data, implementation and certification of traceability in order to favour the  
425 harmonisation of concepts, approaches and terminology, as well as the interoperability of  
426 systems.

427 (h) **Appropriate technology:** Tools and infrastructure to support effective  
428 traceability are a key enabling factor. Digital technologies should be interoperable and  
429 support for their use must come from all actors along the value chain and, when required,  
430 support must also be given to actors so that all value-chain participants have access to the  
431 required technologies.

432 (i) **Inclusiveness:** Traceability systems need to be inclusive, in order to integrate all  
433 stakeholders including small- and medium-sized companies, disadvantaged groups (such as  
434 minorities and women) as well as low and middle-income economies. Acceptance and  
435 support for a traceability system depends on its capability to integrate these stakeholders.

### 436 C. Key traceability system concepts

437 39. *Traceability system* refers to all of the practical processes, procedures and technology  
438 needed to create a functional system.

439 40. Value-chain actors in the garment and footwear industry need to perform due diligence  
440 and exercise responsible business conduct in order to ensure that their products are made in  
441 a way that does not harm the environment or result in unacceptable social conditions

- 442 including human rights violations. Traceability systems are an effective way to monitor and  
 443 report on the sustainability of garment and footwear products throughout the value chain.<sup>11</sup>
- 444 41. Traceability systems can support sustainability **claims** about the characteristics of a  
 445 product, a process or an organization by collecting data to validate these claims based upon  
 446 defined **verification criteria**.
- 447 42. To do this, a system needs to:
- 448 • Identify the sustainability **claim(s)** and the related **verification criteria** which will  
 449 define the traceability information to be collected, exchanged and verified
  - 450 • Identify the **traceable assets** for supporting the claim – which could range from raw  
 451 materials through to final products
  - 452 • Select the most appropriate **traceability models** for organizing the value-chain’s  
 453 processes
  - 454 • Track/identify traceable assets when they are transported in **logistics units**
  - 455 • Consider the needs of post-consumption processes when identifying **verification**  
 456 **criteria**
  - 457 • Mark/tag each traceable asset and logistics unit with a unique **identifier (ID)**
  - 458 • Record and link these IDs to **sustainability information** that will support the  
 459 verification criteria as the traceable assets move between the **entry and exit points**  
 460 for traceability in the value chain
  - 461 • **Have a verification process**, carried out by auditors, which verifies that the data  
 462 collected is accurate, aligned with the verification criteria and supports the claims

463 Table 2.1  
 464 **Summary of key traceability system concepts**

<p><b>C1. Claim</b></p> <p><i>Why traceability? What is its objective?</i></p>	<p>A claim is a high-level statement about a <b>characteristic of a product, or about a process or an organization associated with that product</b> (traceable asset).</p> <p>In order to show that the characteristic is true, <b>it is necessary to trace the asset as it moves through the value chain.</b><sup>12</sup></p>
<p><b>C2. Traceable asset</b></p> <p><i>What is being traced?</i></p>	<p>The claim should be linked to a traceable asset, which is the material or product to be traced. It can be defined at different levels:</p> <ul style="list-style-type: none"> <li>• Individually (for example a single garment)</li> <li>• In batches from raw material production or manufacturing processes (for example a bale of cotton or one machine load of dyed fabric or all of the products produced by one machine during a specified period such as a work shift or a day)</li> <li>• In trade units, which are quantities used for buying and selling (for example a package of shirts or a container-load of thread).</li> </ul> <p>A traceable asset can be transformed or aggregated/disaggregated (into trade or logistic units) along its path. <b>Unique IDs</b> are therefore vital in order to trace an asset back and forward along its path in the value chain.</p> <p>Which traceable assets to use will depend upon the objective(s) of a traceability system and the selected traceability model, as well as the processes in the value chain and the capabilities of value-chain partners.</p>

<sup>11</sup> UNECE, Traceability for Sustainable Trade, A Framework to Design Traceability Systems for Cross Border Trade, ECE/Trade/429, <http://www.unece.org/index.php?id=43763> (accessed 17-05-2020).

<sup>12</sup> UNECE, Traceability for Sustainable Trade, A Framework to Design Traceability Systems for Cross Border Trade, ECE/Trade/429, <http://www.unece.org/index.php?id=43763> (accessed 17-05-2020).

<p><b>C3. Logistics unit</b></p> <p><i>Which package(s), pallet(s), container(s) are my traceable assets being transported in?</i></p>	<p>Logistics units contain traceable assets for transport and/or storage.</p> <p>Most often they contain aggregated traceable assets (for example, multiple fabric rolls in a container), but logistic units may also contain disaggregated traceable assets (for example, one batch of thread spindles that is packaged onto multiple pallets).</p> <p>Logistics units are given IDs in order to follow the traceable assets they contain. This is done by recording the IDs of the traceable asset(s) and linking them to the ID of their logistics unit. As a result, if a logistics unit is lost, the sender or receiver will be able to immediately identify the traceable assets it contained.</p> <p>Sometimes this chain of IDs can also be used for detecting fraud (for example if 6 fabric rolls from a weaver are loaded onto a container and 7, or 5, are unloaded). In addition, because logistics providers track only logistics units (and not what they contain), if there is a need to calculate CO2 emissions, then the information from the logistics provider about transportation routes and modes for a logistics unit needs to be linked to the traceable assets contained in the logistics units.</p>
<p><b>C4. Identifiers (IDs)</b></p> <p><i>How do you know what happens to what is being traced?</i></p>	<p>The path of a traceable asset (e.g. material, product, product batch) consists of a collection of information linked directly or indirectly to the traceable asset. To follow this path, the traceable asset must have a unique Identifier (ID).</p> <p>IDs are also required for all of the entities (i.e. enterprises, locations, logistics units, etc.) and processes that information is collected about.</p> <p>Whenever possible, IDs should be based on open non-proprietary standards in order to support interoperability (for example, ISO/IEC 15459).</p> <p>Many IDs are attached directly to individual traceable assets (products, batches or trade units) or a logistics unit. This is best practice, but is not always possible, especially during transformation processes.</p> <p>For transformations, the IDs and quantities of inputs are recorded, the quantity of output is measured (to be sure it matches the input quantities) and a new ID is given to the output which is linked to its input IDs.</p> <p>How these and other practices result in a “Chain of IDs”, going from the start of traceability through to its end, is explained in more detail below.</p>
<p><b>C5 Traceability models</b></p> <p><i>How should I organize processes to be sure that traceability is preserved?</i></p>	<p>There are three basic models for organizing the flow of traceable assets within a value chain in order to support a claim:</p> <ul style="list-style-type: none"> <li>• Product segregation</li> <li>• Mass balance</li> <li>• Book and claim.</li> </ul> <p>These are applicable across a value chain from the raw materials stage through to finished products and are explained in more detail below</p>
<p><b>C6. Entry and exit points</b></p> <p><i>When does traceability take place?</i></p>	<p>Entry and exit points are <b>the events (activities)</b> at the start and the end of the traceability process within the value chain. At each of these points the traceable asset needs to meet specified criteria. For example, if the entry point is “harvesting cotton,” the entry point criteria could be, “that the cotton must have been raised according to an organic standard”.</p>
<p><b>C7. Verification criteria</b></p> <p><i>Why should anyone believe the claim?</i></p>	<p>Verification criteria define the <b>information to be collected</b> about the traceable asset, and the <b>scope of the verification process</b>. Verification criteria should be objective. These criteria are set by the verification</p>

<p><i>What is the information that needs to be collected in order to verify the claim?</i></p>	<p>requestor. The following description is in line with the ISO definition.<sup>13</sup> Criteria should include:</p> <ul style="list-style-type: none"> <li>• A definition of the claim to be verified including tolerances (for example, 50 per cent organic cotton with a tolerance of 5 per cent)</li> <li>• The applicable process for verification (for example, which data need to be collected, which control methods should be used etc.)</li> <li>• The standards and normative documents against which the claim is verified (e.g. ISO or industry standards/guidelines)</li> </ul>
<p><b>C8. Verification process</b></p> <p><i>How do you prove that your traceability process is working? Who is checking to be sure that the data is accurate and, also that no one is cheating?</i></p>	<p>Verification is “confirmation of a claim, through the provision of objective evidence, that specified requirements have been fulfilled”.<sup>14</sup> In the context of traceability, the verification process is carried out by a verification (audit) body that analyses traceability events and validates the information about them against the verification criteria and any other transparency system rules.</p> <p>Based upon risk analysis, independent verification may only be needed for selected stages of the value chain.</p> <p>An independent verification agency could be from: (i) The public sector, such as a ministry; (ii) The private sector, such as an inspection service or industry association, or (iii) A public private sector partnership (PPP), such as an inspection agency appointed by the government.</p> <p>The role of the verification process is to:</p> <ul style="list-style-type: none"> <li>• Request from stakeholders selected traceability data from the relevant Entry/Exit Points and from business processes between the Entry and Exit Points (i.e. traceability events)</li> <li>• Ensure that the data recorded for traceability purposes reflects what is actually happening in the supply chain (for example through field inspections)</li> <li>• Monitor and safeguard traceability by ensuring that assets meet entry/exit conditions and verification criteria (rules) are applied correctly.<sup>15</sup></li> </ul>

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**1. Sustainability claims**

43. “A claim is a high-level statement about a characteristic of a product, or about a process or an organization associated with that product (traceable asset).”

44. Sustainability claims to support sustainable development objectives should be selected based on a value-chain risk analysis, corporate objectives, and a company’s commitment to responsible business conduct and due diligence. The contents of the claim should be accessible and may need to comply with legal requirements. Also, organizations that develop sustainability standards and guidelines often have rules about how they can be referenced in claims.

45. A claim should contain the following elements:

- **A clear objective** which sets out the **purpose** of tracing, and the sustainability requirement(s) to be met in order to achieve the purpose
- **Description of the traceable asset** for the proposed claim.

<sup>13</sup> Conformity Assessment – General principles and requirements for validation and verification bodies, ISO/IEC IS 17029.

<sup>14</sup> ISO standard: ISO/IEC DIS 17029:2018(E), Section 3, “Terms and Definitions”.

<sup>15</sup> UNECE, Traceability for Sustainable Trade, A Framework to Design Traceability Systems for Cross Border Trade, ECE/Trade/429, <http://www.unecce.org/index.php?id=43763> (accessed 17-05-2020).

- 478 • **Description of the proposed claim.** The claim should support the objective and
  - 479 should be understandable, clearly stated and defined in terms of the physical
  - 480 characteristics or process(s) connected to the traceable asset.
  - 481 • **The defined verification criteria.** Criteria should be objective and measurable. They
  - 482 can be a standard, a guideline or other document which describes the sustainability
  - 483 characteristics that a product, process or organization must have in order to conform
  - 484 to the “claim”. The criteria are what an auditor compares information against to
  - 485 determine if due diligence has been followed in ensuring a claim.
- 486 46. A suggested general format for claims is the following: [Traceable Assets] comply with
- 487 [Claimed State] in accordance with [Verification Criteria] for/to support [Objective].

<p>#1 Example of sustainability Claim</p> <p>(From Brand Y) <b>Imported knitwear</b> contains <b>ethically grown and traded cotton</b> from Country A and is obtained in compliance with the <b>XYZ standard</b> for ensuring <b>responsible business conduct</b>.</p>
<p>#2 Example of sustainability Claim</p> <p>(From Brand X) <b>Imported Ready-made-garments</b> from suppliers in Country B have been manufactured using <b>good labour practices in accordance with the ILO fundamental labour standards</b>, which support <b>sustainable sourcing</b>.</p>

488 **2. Traceable assets**

489 47. A traceable asset is any product or material [individually, in batches or in trade units]

490 that needs to be tracked along a value chain

491 (a) *Granularity of the traceable asset*

492 48. When deciding which traceable assets to use, the **granularity of the traceable asset**

493 needs to be decided upon.

494 49. Granularity determines the physical size of the traceable asset, including how

495 aggregated it is. For example, options for the allocation of unique IDs include every

496 individual product, shipping carton of products, production batch, container of goods, etc. In

497 addition, a “production batch” can be defined at different levels of granularity. For example,

498 a yarn manufacturer can typically choose whether they assign a traceable asset ID to a new

499 production batch every day, every shift (e.g. 2-3 times per day) or to every bobbin, in a

500 particular ring-frame machine.

501 50. Granularity needs to be in line with the type of traceability model that is being

502 implemented. i.e. product segregation, mass balance, or book and claim (for more see section

503 5 on Traceability models). The most appropriate traceability model will depend upon:

- 504 • The nature of the traceable asset; for example, the smallest unit of raw cotton from a
- 505 farm that can be traced is probably a bale of cotton
- 506 • The claim; for example, if the claim says, “this is a real brand X product and not a
- 507 counterfeit”, then the traceable asset will be the finished product and not, necessarily,
- 508 its components
- 509 • The capacities of value-chain participants; for example, some weavers may package
- 510 their fabric in bolts and some in rolls, so it would make no sense to require the tagging
- 511 of fabric bolts in a factory that makes rolls.

512 51. Higher granularity, while it provides greater accuracy, also means higher complexity

513 (more IDs to be used and tracked) and higher costs, both internally and along the value chain

514 (in transformation processes and shipments).

515 (b) *Traceable assets and product transformations*

516 52. Within the textile and leather value chains, traceable assets are periodically used as

517 inputs to processes that transform them into outputs which are new and different traceable

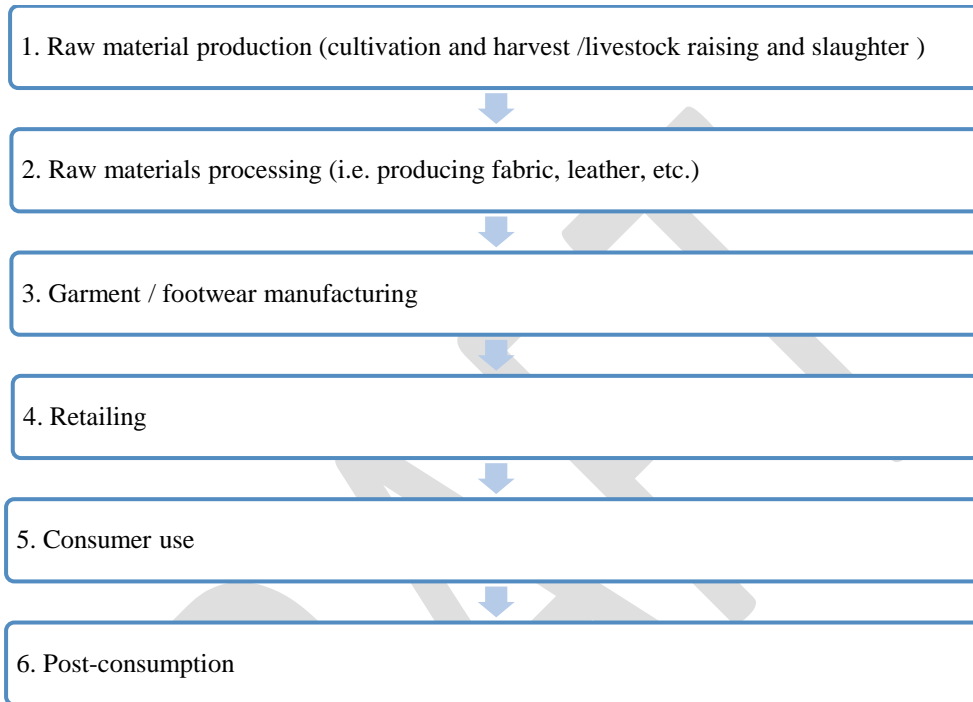


518 assets. These outputs must also be traced, and linked to their inputs, so that when the customer  
 519 receives a final product, all of the inputs can be identified – by following the links of the  
 520 chain back to the beginning.

521 53. Traceable assets need to be defined for each stage in the value chain and the relationship  
 522 between traceable assets that are inputs and traceable assets that are outputs need to be clearly  
 523 defined and recorded.

524 54. The main value-chain stages for textile and leather products, parts and components,  
 525 include:

526 **Figure 2.1**



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 528 55. This can become complicated because there is often not a one to one correspondence.  
 529 For example, 1 batch of spooled thread might contain 3.5 bales of cotton – of which 0.3 bales  
 530 came from a bale that was partially used in a previous batch. As a result, there are 3 bales  
 531 allocated entirely to this batch, and then 0.3 and 0.2 bales (one left over from the previous  
 532 batch and one that is not completely used in this batch) that will need to be shown as input  
 533 to two batches.

534 (c) *Traceability information and data collection methodologies*

535 56. Many points in these Guidelines focus on the information related to identifying traceable  
 536 assets (unique IDs) and identifying the locations and events that the traceable asset passes  
 537 through along the value chain.

538 57. At the same time, traceability and transparency of sustainable value chains requires the  
 539 collection and exchange of information on the sustainability performance of products,  
 540 processes and organizations in the main value chains stages outlines above. This set of  
 541 information is determined by the sustainability claim and careful thought needs to be given  
 542 to the points in the value chain where this information should be collected. Efforts should  
 543 be made to minimize the amount of data collected and to identify existing sources for the data.  
 544 Risk-based analyses of value chains impacts are valuable tools for identifying key  
 545 sustainability data and their collection points within a value chain.

546 58. In addition, for business reasons, it may be useful to collect other information as part of  
 547 a traceability system. Information related to product, processes, facilities/organizations and  
 548 transport may be used by companies to improve the management and efficiency of their value  
 549 chains, thus creating operational savings that could help “pay for” the collection of  
 550 sustainability data. Some examples of where traceability information can improve operations

551 are: greater stock rotation, enhanced use-by data management, reduced shrinkage and  
 552 distressed product sales, less waste, better management of targets (and rewards for reaching  
 553 them) as well as improved service levels.

554 59. The table below gives an overview of the types of information to be collected as part of  
 555 a traceability and transparency system. The specific data to be collected will vary, depending  
 556 upon both the sustainability claims to be supported and the value-chain management and  
 557 sustainability objectives of the implementing parties.

558 Table 2.2  
 559 **Traceability Information** 2.2

560 Table 2.2  
 561 **Traceability Information**

Product-related information	Process-related information	Facility-related information	Transport-related information
<p><b>Origin →</b>                      - Country and/or Region</p> <p><b>Composition →</b>                      - Materials components                      - Product components</p> <p><b>Technical Specifications →</b>                      - Materials specifications                      - Product specifications</p> <p><b>Product identification (IDs) →</b>                      - Individual product/material                      - Product/material batch                      - Product/material trade unit</p> <p><b>Quality →</b>                      - Characteristics                      - Inspections                      - Certificates/audit reports (product/materials)</p> <p><b>Other management information →</b>                      - Cost(s)                      - Sales data                      - Surplus or damaged materials/product                      - Risks</p> <p><b>Sustainability →</b>                      See table below on sustainability data</p>	<p><b>Process inputs and outputs →</b>                      - Input volumes/weights                      - Output volumes/weights</p> <p><b>Process events occurrence →</b>                      - Data                      - Time</p> <p><b>Process identification (IDs) →</b>                      - Process (product) inputs                      - Process (product) outputs                      - Type of process                      - Equipment (machine)                      - Machine operator</p> <p><b>Sustainability →</b>                      See table below on sustainability data</p>	<p><b>Economic-operator details →</b>                      - Supplier                      - Manufacturer                      - Subcontractor</p> <p><b>Location →</b>                      - Main production unit(s)                      - Subordinate production unit(s)</p> <p><b>Facility &amp; economic-operator identification (IDs) →</b>                      - Economic Operator                      - Main facility                      - Subordinate facility</p> <p><b>Sustainability →</b>                      See table below on sustainability data</p>	<p><b>Economic-operator details →</b>                      - Transport or freight forwarding company                      - Owner/Operator of the means of transport</p> <p><b>Location →</b>                      - For picking up logistics units                      - For delivering logistics units</p> <p><b>Transportation (IDs) →</b>                      - Logistics Units                      - Conveyance means (truck, railcar, ship, container if applicable)</p> <p><b>Sustainability →</b>                      See table below on sustainability data</p>

Product-related information	Process-related information	Facility-related information	Transport-related information
<b>Sustainability related information<sup>16</sup></b>			
<b>Environmental</b>	<b>Social</b>	<b>Health &amp; Safety</b>	
Inputs (Chemicals/Pesticides) Water consumption and pollution CO2 generated Energy Air pollution Thermal pollution Noise pollution Soil and land degradation Habitat loss Deforestation Biodiversity and ecosystem depletion Livestock/Animal welfare Waste/End-of-life → - Durability - Recyclability - Reusability Environmental management standards implementation	Human resources & Local communities → - Child labour - Forced and compulsory labour - Land use  Labour practices-Human development & Social dialogue → - Work & social protection conditions - Trade unions and collective bargaining - Wages - Working times  Employment & Employment conditions → - Sexual harassment - Gender inequality - Discrimination - Homeworkers	Health & Safety → - Norms and standards implementation	
		<b>Ethics</b>	
		Compliance with legislation/regulations Anti-bribery/corruption Permits Contracts	
<b>Sustainability Certificates (or Inspection Reports)</b>			
Certificate Type Certificate ID Issue and expiry dates Issuing agency ID (optional: name & address) Standards certified/inspected for Claim and approved or not Additional data			

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### 3. Logistics unit

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60. Giving IDs to logistics units is important for preserving chain-of-custody information across transport activities. There is, however, nothing more to add to their description than what is found in the table at the beginning of this section.

<sup>16</sup> OECD (2018), OECD Due Diligence Guidance for Responsible Supply Chains in the Garment and Footwear Sector; ITC Standards Map (2019); UNEP (2020) draft report for circularity and sustainability in textile value chains (to be issued in September 2020); SA8000® Standard - SAI - Social Accountability International; Sustainable Apparel Coalition (2018); Global Reporting Initiative, Sustainability Reporting Standards (2018), Boston Consulting Group and Global Fashion Agenda (2018); UNECE 2018

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#### 4. Unique identifiers (IDs)

61. Traceability requires information about traceable assets, including information about their what, where, when, who and why. To specify the asset and link it to events, each of the following six data components of a traceability system that are related to an event must have a unique identifier (ID) if a system is recording information about that component.

- **Party** (company or individual – farmer, tanner, ginner, weaver, subcontractor...)
- **Traceable asset** (raw material, intermediate or finished product, production or product batch, or trade unit)
- **Facility** (farm, manufacturing site, etc.)
- **Process** (harvesting, spinning, dyeing, etc.)
- **Location** (farm, production site, etc.)
- **Transport** (means of conveyance for goods and **logistics units** used for transporting traceable assets).

62. Each event that affects the traceable asset should be registered and linked to the relevant ID(s).

63. The uniqueness of IDs for traceable assets should be ensured by whomever assigns the ID, which could be a party within a company (i.e. for production batch IDs) or a trading partner in the value chain (i.e. for trade-unit numbers such as packages), etc. It is also important, to the maximum extent possible, that IDs be selected and attached to traceable assets in a way that prevents the ID from being counterfeited or lost.

64. Because value chains include multiple partners, interoperability (ability to exchange data with a minimum amount of transformation) is important. The best way to achieve interoperability is to agree upon a common standard for both IDs and the format of the data to be exchanged. There are many options for ID standards, a number of which are shown in table 2.3 below. For operating purposes, it is important that each supply chain participant have control over their own IDs, within the context of the agreed standard.

##### (a) *Maintaining traceability information across product transformations in the value chain*

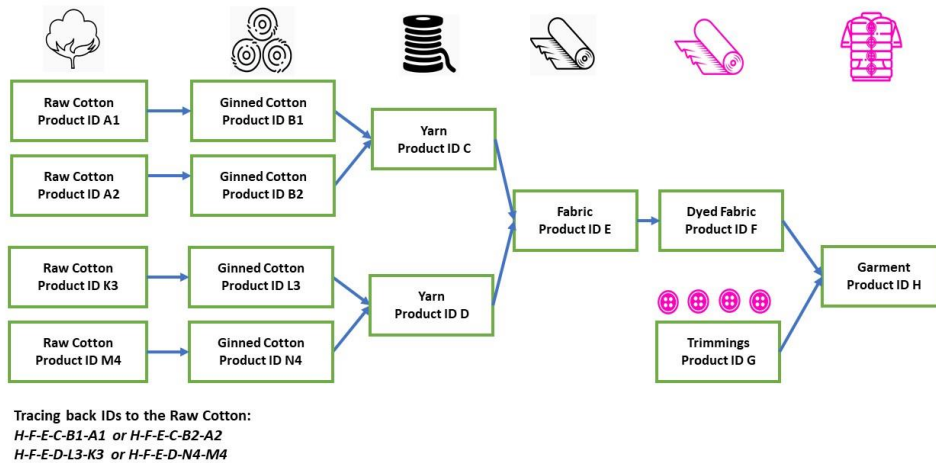
65. The majority of traceable assets are transformed as they move through a value chain. Therefore, the effectiveness of a traceability system depends upon maintaining accurate links to information about materials and products as they move through various transformations.

66. For example, at the beginning of the value chain, the traceable asset may be a bale of cotton, which is transformed into thread, then into cloth and, at the end, it may be a shipping carton of cotton shirts. Each of these traceable assets (cotton bale, thread, fabric, carton of shirts, etc.) must have a unique ID that is linked to the unique ids of the input(s) used for its creation.

67. In other words, all the transformations which a given traceable asset passes through should be recorded in a way that it can be associated with its “ancestors” (i.e. the IDs for the inputs to the traceable asset), and with its “progeny” (i.e. the IDs of the outputs where the traceable asset was an input). Because value chains can be quite complicated this can result in different scenarios for the splitting, joining and merging of traceable assets.

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Figure 2.2



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68. Maintaining accurate links between IDs across the value chain is called *referential integrity*. In order to monitor the referential integrity of identifiers for traceable assets along the value chain, as well as for verifying other traceability information, links must be established between identifiers for traceable assets and identifiers for companies and physical places. A range of options exist for IDs, some of which are given in the box below.

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Table 2.3

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Examples of IDs

ID	Type of ID
United Nations Location Code (UN/LOCODE)	Location
Global Legal Entity Identifier (LEI)	Organization
Global Trade Item Number (GTIN)	Product
National tax IDs for companies	Organization

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69. The information linked to IDs depends upon what the “Requestor of Traceability” has asked for and what is needed to perform due diligence in support of the claim. There are a wide range of options including test or audit results, the IDs for inputs, the certification status of value-chain participants and/or the certification of specific locations, production lines or processes within a larger company), etc.

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70. In addition to changing when there are transformation events, IDs for traceable assets may change based on aggregation or dis-aggregation events. To give a simple example, aggregation could be the placing of multiple products in one box for sale as “a box” and disaggregation could be the removal of products from a box for the purpose of sale as individual items. If the custody and/or location of goods is being traced, it is also important to record unique IDs for logistics units. A logistics unit is created when traceable assets are aggregated (put together) or disaggregated for the purposes of transport and the size of logistics units can range from boxes to pallets to containers.

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71. Information about possession of the goods (for example by processors, sub-contractors, transporters and/or warehouses), is also known as “chain of custody” (see box 2.1). This can be used for inventory management, for locating goods and for identifying who possessed goods and when negative events occur such as damage or “contamination” with goods from outside of the traceability network (i.e. with goods that may not conform with the product claim).

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636 72. Successive links in the value chain between traceable assets, and between traceable  
 637 assets and logistics units, should be recorded. For this to happen a traceability system should:

- 638 • Ensure a secure integration between the physical product levels (represented by the  
 639 unique IDs for traceable assets) and the information associated with IDs at each level.
- 640 • Ensure an accurate history of traceable assets<sup>17</sup> throughout the transformation,  
 641 shipping and storage processes. This history includes: i) the links between IDs (i.e.  
 642 between input and output IDs and between logistics-unit and traceable-asset IDs) and  
 643 ii) the links between traceable-asset IDs and associated information about some or all  
 644 of the traceability components listed at the beginning of this section.
- 645 • Predefine, in line with company objectives and the product claim(s), the information  
 646 to be recorded during transformation, aggregation and dis-aggregation processes  
 647 throughout the entire value chain.
- 648 • Ensure continuous monitoring and periodic validation of the data recorded at each  
 649 process stage.
- 650 • Associate the flow of information with the physical flow of the products by  
 651 registering departures and arrivals.

652 In summary, implementors will need to put in place two types of identifiers:

- 653 1) Unique identifiers for the identification of categories or types of entities. For  
 654 example, types of garments (SKUs), machines, materials, etc. For many of these  
 655 categories, for example, type of package or type of transport mode, there are  
 656 existing standards in the form of code lists. Some of these are maintained by  
 657 industry bodies, some by standards bodies such as UN/CEFACT.
- 658 2) Unique identifiers for individual entities. For example, products with serial  
 659 numbers, companies, production batches, shipping containers, etc.

660 For some entities both types of identifiers will be needed, for some only one.

661 Which IDs need to be implemented and when will depend upon the claims being made, the  
 662 products, processes, etc. Following is a list with some of the entities for which IDs, of both  
 663 types, are frequently implemented.

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Entities for which IDs are frequently implemented			
<ul style="list-style-type: none"> <li>• Parties</li> <li>• Organizations</li> <li>• Production Facilities</li> <li>• Production Units</li> </ul>	<ul style="list-style-type: none"> <li>• Materials</li> <li>• Products</li> <li>• Product Batches</li> <li>• Production Processes</li> </ul>	<ul style="list-style-type: none"> <li>• Transport means (i.e. trucks)</li> <li>• Transport containers</li> <li>• Logistic Units</li> </ul>	<ul style="list-style-type: none"> <li>• Location (for any entity, but frequently for facilities, storage, transport pick up or delivery, etc.)</li> </ul>

<sup>17</sup> In the case of “book and claim” based traceability systems, the certificates used for “booking” the claims must be firmly linked to the traceable asset that the claim is being made about. For example, if the claim is about use of organic cotton and certificates are purchased to claim as organic 100% of a cotton batch A, as that cotton goes through the value chain, and is mixed with cotton for which no certificates were purchased, it is important to ensure that the “claimed” amount of organic cotton content does not exceed the amount of cotton specified on the purchased certificates that come with batch A.

665 73. Information about possession of the goods (for example by processors, sub-contractors,  
 666 transporters and/or warehouses), is also known as “chain of custody” (see box 2.1). This can  
 667 be used for inventory management, for locating goods and for identifying who possessed  
 668 goods and when negative events occur such as damage or “contamination” with goods from  
 669 outside of the traceability network (i.e. with goods that may not conform with the product  
 670 claim).

#### Box 2.1

##### **Traceability or Chain of Custody?**

An often-used definition of **traceability** is found in the International Standardization Organization (ISO) standard 8402 which defines it as: “The ability to trace the history, application or location of an entity by means of recorded identifications.” In another ISO example, traceability is defined in ISO 9000 and ISO 22005 as “The ability to trace the history, application or location of that which is under consideration” (Olsen, P., & Borit, M., How to define traceability, Trends in Food Science & Technology (2012), <http://dx.doi.org/10.1016/j.tifs.2012.10.003>).

A “traceability system” is one that implements traceability as described in one of the very similar definitions given above.

**Chain of Custody** in supply chains has its origin in the legal term which refers to, “A chronological documentation of the handling of evidence throughout a criminal investigation....When a trial takes place, the prosecution and defence use evidence to prove the facts of the case.... A primary means of authenticating an item involves analysing the chain of custody for evidence. This refers to the chronological documentation of who handled it, what they did with it, and where they stored it.”<sup>1</sup>

If you substitute “product” or “traceable asset” for “it” in the last sentence, then you also have a good definition for chain of custody in value chains.

This illustrates that the concepts of “traceability system” and “chain of custody” are very close and, at least in some cases, appear to be synonymous (when traceability starts at the moment of creation of a traceable asset). Unfortunately, in the literature on traceability and chain of custody there does not appear to be a consensus on the difference, so one can find different texts that give almost the same definition for traceability as for chain of custody and vice versa.

##### **Therefore, in these Guidelines**

- “Traceability” is defined as “the ability to trace the history, application or location of an object” in a supply chain (ISO, 2015).
- “Traceability system” means the practical system of processes, procedures and information exchanges that implements traceability.
- “Chain of Custody” refers to the documented chain of parties who had possession of the goods at every moment between the entry and exit points in the value chain where traceability took place (ISO / PC 308 ISO (draft) standard 22095).

671 74. Successive links in the value chain between traceable assets, and between traceable  
 672 assets and logistics units, should be recorded. For this to happen a traceability system should:

- 673 • Ensure a secure integration between the physical product levels (represented by the  
 674 unique IDs for traceable assets) and the information associated with IDs at each level.
- 675 • Ensure an accurate history of traceable assets<sup>18</sup> throughout the transformation,  
 676 shipping and storage processes. This history includes: i) the links between IDs (i.e.

<sup>18</sup> In the case of “book and claim” based traceability systems, the certificates used for “booking” the claims must be firmly linked to the traceable asset that the claim is being made about. For example, if the claim is about use of organic cotton and certificates are purchased to claim as organic 100% of cotton bale A, as that cotton goes through the value chain, and is mixed with cotton for which no

- 677 between input and output IDs and between logistics-unit and traceable-asset IDs) and  
 678 ii) the links between traceable-asset IDs and associated information about some or all  
 679 of the traceability components listed at the beginning of this section.
- 680 • Predefine, in line with company objectives and the product claim(s), the information  
 681 to be recorded during transformation, aggregation and dis-aggregation processes  
 682 throughout the entire value chain.
  - 683 • Ensure continuous monitoring and periodic validation of the data recorded at each  
 684 process stage.
  - 685 • Associate the flow of information with the physical flow of the products by  
 686 registering departures and arrivals.

## 687 5. Traceability models

688 75. “Traceability model” refers to the organization of a value chain in order to ensure that  
 689 traceability can be implemented. There are different traceability models whose usefulness  
 690 depends upon the type of product and the claims being made. The most appropriate model  
 691 may also change along the value chain. Therefore, value chains may need to implement more  
 692 than one traceability model. Examples of traceability models which can be applied to  
 693 products throughout the entire value chain are product segregation, mass balance, and book  
 694 and claim.

695 76. The most appropriate traceability model will depend upon factors such as:

- 696 • The nature of the traceable asset; for example, the smallest unit of raw cotton from a  
 697 farm that can be traced is probably a bale of cotton.
- 698 • The claim; for example, if the claim says, “this is a real brand X product and not a  
 699 counterfeit”, then the traceable asset will be the finished product and not, necessarily,  
 700 its components. There are also significant differences in the traceability required for  
 701 claims about materials (for example type of cotton) and the traceability for claims  
 702 about processes or organizations (for example, no use of child labour).
- 703 • The capacities of value-chain participants; for example, some weavers may package  
 704 their fabric in bolts and some in rolls, so it would make no sense to require the tagging  
 705 of fabric bolts in a factory that makes rolls.

706 Figure 2.3

707 (a) *Product segregation (the preferred and most demanding model)*

708 77. The preferred model for a traceability system is product segregation. The objective is:

- 709 • Products produced according to the same sustainability standard are strictly separated  
 710 from other products.
- 711 • Bulk raw materials which are certified are strictly separated from non-certified  
 712 materials (but at the same time allowing mixing of certified materials from different  
 713 producers).
- 714 • Material which is certified is strictly separated from the noncertified materials  
 715 throughout the value chain to provide traceability from a specific plantation to the  
 716 final consumers (Identity preservation).

717 78. With product segregation there is a physical separation of certified materials and  
 718 products from non-certified materials and products at each stage in the value chain. This  
 719 ensures that certified and non-certified materials and products are not mixed and that the end  
 720 product comes from a certified source.

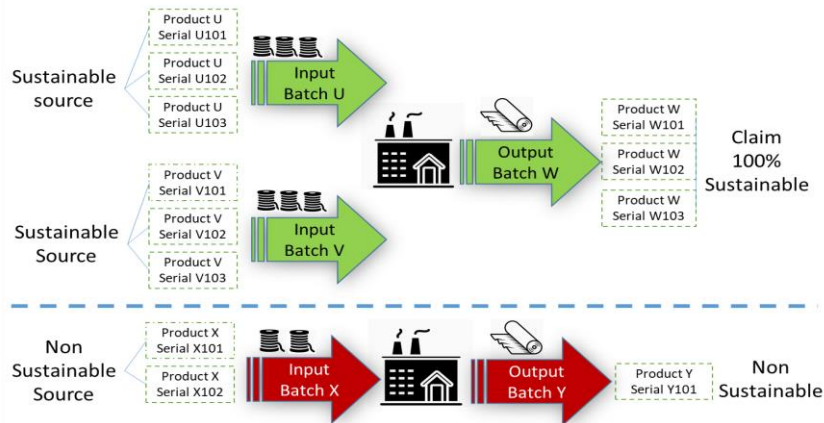
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certificates were purchased, it is important to ensure that the “claimed” organic cotton content does not exceed the amount of cotton that comes from bale A.



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Figure 2.4  
**Product Segregation**



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79. There are two product segregation approaches: Bulk Commodity and Identity Preservation (IP). Whenever sellers are required to be able to identify the supplier of the traceable asset, Identity Preservation is required. For example, in the EU this is the case for timber and fish and in the United States for timber and conflict minerals.

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- **Bulk Commodity** separates certified raw materials from non-certified materials but allows mixing of certified materials from different producers. All producers must comply with the certification standards. This model is often used for organic raw materials such as organic cotton or vegetables.

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- **Identity Preservation (IP)** also requires segregation of the certified material from the non-certified material but it **does not** allow mixing of certified materials from different producers in the value chain. The IP model enables the traceability of products back to the originating farm, forest or production site. The IP model is sometimes criticized for being cost and resource intensive and requiring advanced technology since all material sources must be strictly separated, controlled and monitored at each stage of the supply chain. In order to implement the IP model, companies must know all their suppliers and collect and verify data at all levels throughout the supply chain.

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80. Product segregation requires a well-defined administration and process design in order to be implemented.

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(b) *Mass balance (a moderately demanding method)*

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81. It is not always feasible to segregate sustainable and non-sustainable products and materials from the perspective of efficiency and/or production processes. In the Mass-Balance model, products from both sustainable and non-sustainable sources are mixed, but as they move through the supply chain an exact account is kept of the volume ratios. The purpose is to guarantee that the amount of sustainable content claimed is equal to the amount of sustainable products or materials used. As is the case for product segregation, implementing a mass-balance model requires a well-defined administration and process design.

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Figure 2.5  
**Mass Balance**



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82. This model is commonly used for products and raw materials where segregation is very difficult or impossible to achieve, such as for cocoa, cotton, sugar and tea.

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(c) *Book and Claim (the least demanding model)*

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83. If product segregation is impossible (e.g. green electricity) or the registration of the volume ratios of sustainable and non-sustainable products and materials is impossible, a Book & Claim model can be applied.

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84. When non-sustainable and sustainable physical products or materials are mixed and sold, the right to claim sustainable sourcing is traded in the form of sustainability certificates. A central authority monitors the sustainability claims by brands and retailers and compares these with the number of certificates issued and traded.

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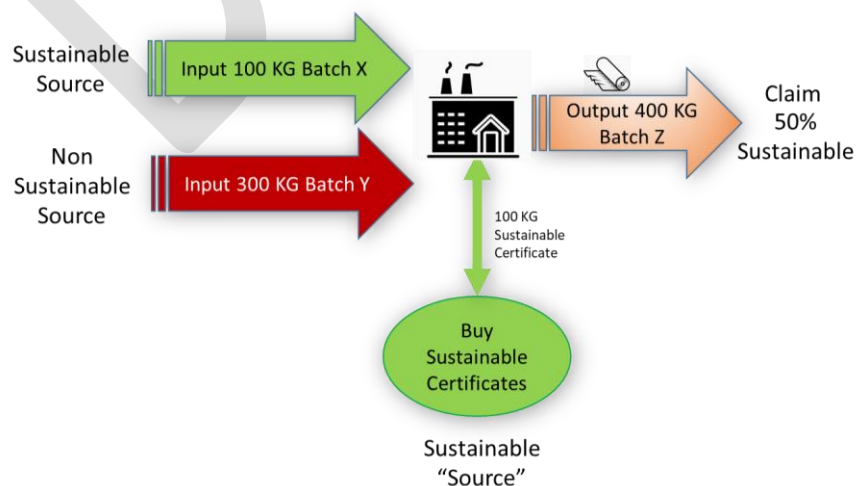
85. In the book-and-claim method there is a free flow and mixing of certified and non-certified assets, with no segregation of assets, so it is actually a mixed product that is sold. Instead, a producing company can obtain sustainability certificates for the volume of goods that it puts into the value chain which are certified as following a good practice. These certificates are then sold via a platform, or by the certifying organization, to companies who use the type of goods in question as inputs to their products. The purchaser of the certificates can then claim that their product supports the sourcing and production of raw materials grown or processed according to the good practice in question – even if it is not certain that their product actually contains certified material.

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86. The earnings from the sale of certificates is then used to make payments to the producers whose goods were certified as using the good practice, thus providing an incentive for other growers to be certified.

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Figure 2.6  
**Book and Claim**



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87. This model is typically used when the production and market conditions make it impractical to sell certified product that has been segregated from non-certified product. At

782 the same time, this model requires audit trails in order to demonstrate that for every certificate  
 783 sold, certified growers have been compensated for the associated quantity of certified goods.  
 784 This model is used for soy and palm oil.

785 88. In summary, product segregation requires advanced Information and Communication  
 786 Technology (ICT) implementations, in which the farmers and micro-, small- and medium-  
 787 sized enterprises (MSMEs) participate. It is used for high-risk and delicate products, such as  
 788 fresh food, high-value products and products where regulations require that the specific  
 789 origin of the product be known. Mass balance and the book-and-claim models, on the other  
 790 hand, require less advanced ICT systems. This is because they are based on a set of rules and  
 791 require only periodic auditing by stakeholders. As a result, one factor that must be taken into  
 792 account when selecting a traceability model is the ICT capabilities of participants in in value  
 793 chains – which vary greatly.

## 794 6. Entry and exit points

795 89. Entry and exit points are the events (activities) at the start and the end of the traceability  
 796 process within the value chain. At each of these points the traceable asset needs to meet  
 797 specified criteria.<sup>19</sup>

798 90. **The primary factor in deciding upon entry and exit points should be the**  
 799 **identification of what must be traced, and when, in order to support the claim.**

800 • Keeping in mind the claim, it is important to clearly establish the authorized  
 801 activity(ies) or locations where the traceable asset enters and exits the **traceability**  
 802 system.

803 • Based on the verification required for a specific claim, the transformation and  
 804 logistics processes that take place between the entry and exit points in the value chain  
 805 should be visible. Visibility at each node (activity or location) consists of providing  
 806 a minimum set of information including a location ID, a timestamp for entry and one  
 807 for exit from the activity, the ID for the traceable asset coming out of a process and  
 808 the ID(s) for its ancestors (the inputs). This is greatly facilitated when there are  
 809 information systems for data interchange, and standards for determining the types and  
 810 formats of the data elements to be recorded.

811 91. This means the first step in developing the traceability solution is identifying the entry  
 812 and exit points (value-chain activities) which mark the start and the end of the value chain  
 813 that the traceability system will trace. Good choices for Entry and Exit Points are locations  
 814 where business processes are well controlled, i.e. where there is a high level of automation  
 815 and business processes are well documented and enforced.<sup>20</sup>

816 92. The traceable asset is assumed to have specific and defined states at the entry and exit  
 817 points. An example of typical entry and exit points are landing zones in ports, Customs  
 818 control points, inspection points, etc. For example, one system for sustainable furs uses a  
 819 certification system for farms who have an ID that is registered with a third party and each  
 820 fur has a unique ID tied to the farm it came from. As a result, auction houses can trace a pelt  
 821 back to its origin. Therefore, the auction house could be a good entry point for a traceability  
 822 system that supports a claim about good animal welfare practices at fur farms.

823 93. Another example, from Costa Rica, is for tracing shark fins (an internationally  
 824 controlled product) where an entry and exit point could be defined as follows:

825 • Entry Point: Medium or large-scale longline boats must land sharks in a Costa Rican  
 826 port that is authorised by the Costa Rican Ministry of Fisheries and under no  
 827 circumstances without the presence of a fishery inspector.

828 • Exit Point: Submission of Customs declaration for the export of sharks or derived  
 829 products.

<sup>19</sup> The document ECE/TRADE/429 provides guidelines to take into consideration when deciding upon, reporting and monitoring traceability systems' entry and exit points.

<sup>20</sup> For further detailed, see document ECE/TRADE/429.

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## 7. Verification criteria

94. Verification criteria are the standards and key performance indicators that traceable assets are supposed to meet and the rules for the supporting traceability process. These criteria are the basis upon which verification processes are carried out by auditors or other verification agencies in order to prove that the traceable assets have complied with relevant claims.

95. As discussed above, for the success of a traceability system it is important to have well-defined states at the entry point and the exit point as these are among the verification criteria.

96. Other verification criteria that may be useful include:

- Defined governance options and mandates that assign responsibilities for the co-ordination, implementation and distribution of traceability tasks and their verification.
- Procedures for organizing, recording and reporting **product conditions** at entry/exit points as well as at transformation, aggregation and disaggregation event points (see the section on traceable assets above) as well as the beginning and end of shipment processes in line with regulatory guidelines, standards or certificates or other sustainability criteria.

## 8. Verification processes: the role of audit and certification

97. A traceability system can be imagined as a filing cabinet because it requires the systematic identification, storing and retrieving of data. Importantly, neither a traceability system nor a filing cabinet care about what types of data are being stored.<sup>21</sup> Fraud and errors can falsify records or render them incomplete; thus, the need to verify data, using comprehensive verification methods, including audit, certification, chain of custody information, and physical markers.<sup>22</sup> The level of verification and the methods used depend upon the requirements defined by the Traceability Requestor.

### (a) Audit

98. To create confidence in a claim an audit process should take place in order to confirm that the predefined rules for the traceability process have been followed, and prove that the traceable assets comply with the defined sustainability requirements and their performance indicators.

99. An audit agency performs audits to protect the integrity of the claim and may include audits of management systems. The agency collaborates with relevant value-chain partners and government agencies. It receives data on relevant events in the value-chain transactions and evaluates the information against the defined conditions and rules.

100. The role of the audit agency is to:

- Examine data from the relevant Entry/Exit Points in the value chain
- Examine data on the business processes recorded between the entry and exit Points (i.e. traceability events)
- Ensure that the data recorded for traceability is consistent with what is actually happening in the value chain
- Monitor and safeguard traceability by ensuring that assets meet entry/exit conditions and rules are applied correctly.

101. The audit agency could be: from the public sector, connected to a ministry; from the private sector, for example an industry association or a private inspection agency; or it could be a public private sector partnership (PPP), such as an inspection agency appointed by a government.

<sup>21</sup> Olsen and Borit, 2013.

<sup>22</sup> Kelly et al., 2011.

876 (b) *Certification*

877 102. Certification of sustainability practices can be an important tool as part of a company's  
 878 due diligence. At the same time, it is worth mentioning that it is a complementary and not a  
 879 sufficient tool because it needs to be undertaken following best practices and implemented  
 880 in conjunction with robust traceability. Certification plays a similar role to that of  
 881 independent audits (third party validation of sustainability claims), as its role is primarily for  
 882 verification. Certification can provide trust and facilitate the collaboration process among  
 883 value-chain actors. At the same time, it imposes additional administrative and organizational  
 884 costs and, when it is used, best practices should be followed. Certification for sustainability  
 885 processes that follow best practices:

- 886 • Are independent
- 887 • Are aligned with internationally recognised standards for sustainability and
- 888 circularity of value chains in garment and footwear (e.g. ILO fundamental labour
- 889 standards, OECD due diligence guidelines, etc.)
- 890 • Evaluate both environmental and social criteria on a scientific basis
- 891 • Follow a risk-based approach
- 892 • Verify full chain-of-custody with an eye to avoiding fraudulent mixing of non-
- 893 certified materials
- 894 • Are easy to use and understand
- 895 • Are affordable and scalable
- 896 • Make training available to small value-chain actors on how to follow the standards
- 897 and practices upon which the certification is based.

898 103. Certification bodies should document the governance of their certification process as  
 899 well as the criteria and methods used, in a transparent and clear manner.

900 **D. Cost allocation and incentive systems**

901 104. Estimating the implementation cost of a traceability and transparency framework and  
 902 making decisions on cost allocation is a key element in its uptake and implementation. In this  
 903 connection, a key role is also played by effective and efficient systems of both public and  
 904 private incentives and accountability mechanisms

905 105. Costs related to traceability and transparency exist in two forms: the first is the cost  
 906 linked to the development of the system; the second is the cost for its ongoing  
 907 implementation, including for data collection, supporting data exchange between systems,  
 908 inventory management and labelling. In addition, there may be costs associated with meeting  
 909 sustainability verification criteria such as certification or audit. It is important to highlight  
 910 that development costs also include identifying and implementing a standardized dataset for  
 911 information exchange among partners. The use of such standardized datasets is key to  
 912 ensuring that everyone is “speaking the same language” and that shared data is interpreted  
 913 consistently and correctly. The decision about which information exchange standards to use  
 914 should consider not just the costs on a short-term basis, but also the longer-term efficiency  
 915 gains from having common data standards used by all actors across the whole value chain.  
 916 The UN/CEFACT information exchange standard for traceability and transparency of  
 917 sustainable value chains in the garment and footwear industry serves this purpose.

918 106. When deciding the cost structure for value-chain partners, criteria that could be taken  
 919 into consideration are:

- 920 • How the profit margins are distributed
- 921 • The relative price of partners' outputs
- 922 • Partners' product volumes
- 923 • Partners' needs

- 924 • The allocation of benefits from the traceability system.
- 925 107. When it comes to incentive systems for value-chain partners, two main types of
- 926 **incentives** can be identified: financial and non-financial.
- 927 108. **Financial incentives** include economic and fiscal incentives, both positive and
- 928 negative, that **Governments** can adopt to support value-chain traceability and transparency.
- 929 Among these possible incentives are:
- 930 • Financial support to digital technological innovation
- 931 • Investments in physical and digital infrastructure
- 932 • Direct incentives for the development of interoperable solutions and digitalization
- 933 • Preferential financing loans and grants on the base of traceability and transparency
- 934 criteria
- 935 • Funding of feasibility studies and pilot projects, in particular in value chains with a
- 936 high concentration of SMEs.
- 937 109. Governments and, for developing countries, also financial institutions and donors,
- 938 should consider supporting projects that create shared value for a large number of
- 939 stakeholders and value-chain actors, giving priority to SMEs and small suppliers in emerging
- 940 countries.
- 941 110. On the other end, **industry actors** such as brands and retailers, could consider
- 942 implementing private financial incentive schemes for: suppliers of traceable fibres and
- 943 materials, or suppliers with harmonized, or interoperable systems or small suppliers needing
- 944 assistance in order to cover part of the initial implementation cost.
- 945 111. **Non-financial incentives** are complementary to financial incentives. On the
- 946 **government** side, such incentives could include:
- 947 • Measures to facilitate market access
- 948 • Fast-track processes and expedited customs clearance for products with higher
- 949 traceability and transparency
- 950 • Specialized managerial and workforce training
- 951 • The development and nurturing of open source tools (see box 2.2)
- 952 • Traceability and transparency criteria for green and socially responsible public
- 953 procurement
- 954 • Cradle to cradle criteria as part of an overall policy for waste management supported
- 955 by government procurement and
- 956 • Public visibility, both positive and negative.
- 957 In addition, **industry actors** could encourage participation through user-friendly interface
- 958 designs for the Apps used for data entry to make this as simple as possible and free training
- 959 for SMEs in their value chains.
- 960 112. The underlying principle behind the use of incentives is to lighten the burden for actors
- 961 such as SMEs, women-led firms and value-chain participants in developing countries.
- 962 113. With regard to responsibility, a **shared accountability** principle is suggested: every
- 963 actor in the value chain should be held accountable for any lack of traceability and
- 964 transparency within their “link” in the chain. The role of Governments is to adopt and enforce
- 965 regulatory systems (in particular, norms) that create a level playing field both within their
- 966 country and at an international level. Intergovernmental Organizations and International
- 967 Non-Governmental Organizations can help by supporting the alignment of initiatives and
- 968 legislation around a model regulation for traceability and transparency, both in developed
- 969 countries where value chains are often “designed” and in developing countries where
- 970 manufacturing and labour-intensive activities are predominant. Legislation should enable
- 971 accountability and identify remediation mechanisms and mediation actors.

Box **2.2**  
**Definition of Open Source**

Open Source makes available free resources, thus facilitating access by SMEs, developing countries and academic institutions as well as allowing large organizations to make better use of their resources. It originated with Open-Source Software and, over the years, has also taken hold in engineering and other fields. A definition of Open Source Software can be found on the website of the Open-Source Initiative (OSI) at <https://opensource.org/osd>. Open source use is based upon the granting of licences and variety of standard licences meet this definition. The most used are listed at <https://opensource.org/licenses>.

A summary of the OSI open source definition is below. It is, generally, also applicable to open source in other fields - if one substitutes relevant equivalents for the terms “source code,” “program(s)” and “software”. Places where there is additional text in the definition are marked with “...”

*“The distribution terms of open-source software must comply with the following criteria:*

- 1. Free Redistribution.....*
- 2. Source Code - The program must include source code, and must allow distribution in source code...*
- 3. Derived Works - The license must allow modifications and derived works....*
- 4. Integrity of The Author's Source Code.....The license must explicitly permit distribution of software built from modified source code. ....*
- 5. No Discrimination Against Persons or Groups - The license must not discriminate against any person or group of persons.*
- 6. No Discrimination Against Fields of Endeavor - The license must not restrict anyone from making use of the program in a specific field of endeavour....*
- 7. Distribution of License*  
*The rights attached to the program must apply to all to whom the program is redistributed....*
- 8. License Must Not Be Specific to a Product...*
- 9. License Must Not Restrict Other Software... that is distributed along with the licensed software*
- 10. License Must Be Technology-Neutral...”*

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**E. Supporting role of advanced technologies**

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114. Global value chains pose great challenges for risk management particularly in the area of sustainability. To address these challenges, an increasing role is being played by advanced technologies such as distributed ledgers (blockchains), Artificial Intelligence (AI), machine learning, the Internet of Things (IoT), and DNA marking – to name just a few.

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115. Among the key challenges in value-chain risk management are the need to collect large amounts of trustworthy data across many participants and geographic areas as well as the need to analyse this data in a timely manner. Advanced technologies have an important role in these areas and can help stakeholders to: comply with due diligence; implement traceability and transparency requirements in support of sustainability; and improve their operations.

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116. Advanced technologies, such as those listed in table 2.3, can support improved value-chain traceability and transparency by:

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- Making standardized information about product origin and other characteristics, such as those for sustainability, available in a transparent and standardized way
- Facilitating the real-time sharing of reliable, up-to-date information
- Assigning reliable digital identities to products, parts and components
- Collecting and storing information about these identities

- Analysing large volumes of data in support of improved risk and operations management.

117. It is important, as discussed in the section on inclusiveness, to ensure that the use of advanced technologies is an inclusive process and not one that ends up excluding participants. At the same time, advanced technologies have a catalytic role to play in creating higher connectivity between value-chain partners and incentives for stakeholders to invest over the long term. They can turn challenges into new opportunities for a responsible industry, building confidence that facilitates trustworthy and efficient data collection and verification as well as improved analysis.

118. There are a number of policies and practices that can support the use of advanced technologies. For instance, access is facilitated by support for training in new technologies, open innovation and open source software (see box 2.2), as well as by the development of information infrastructure such as affordable Internet access and an active ICT services sector.

Table 2.3

**List of advanced technologies that can support traceability and transparency**

Advanced technologies	Supporting role in traceability and transparency
Artificial Intelligence (AI) and machine learning systems	Can use the data from traceability systems for risk analysis, for optimizing value chains and operating processes as well as for tracking textile waste.
Blockchain	Provides enhanced data reconciliation and tracing; trustworthy, real-time data updating and access to the same information by multiple stakeholders - thus providing the same “truth” for everyone; and improved confidence in the trustworthiness of data A separate text box, below this table, describes two recent blockchain initiatives in textile sector.
Internet Cloud Services	Allow multiple parties to share common software services as well as to access and update the same data sources.
Distributed databases and data pipelines	Allow access to data stored in multiple locations using tools similar to those for accessing a single source of data, thus avoiding some of the problems of central database administration while offering an experience that is similar to the user.
Internet of Things	Increase automation in data collection. In addition, as low-energy and sensor technologies for IoT devices advance, they also allow for the automated collection of new data (such as the temperature inside of containers and other logistics units or the use of water/chemicals by manufacturing machinery)
Advanced product labelling <ul style="list-style-type: none"> <li>• Quick Response (QR) codes</li> <li>• Product DNA labelling</li> <li>• Radio Frequency IDs (RFID)</li> <li>• Near-Field Communications (NFC) labels</li> </ul>	Allow the “attaching” of additional data to traceable assets and the automated collection of higher-quality track and trace information.  These labelling technologies, which include both digital and physical markers, when used together with other technologies such as blockchain and AI, can also provide: <ul style="list-style-type: none"> <li>• Greater accuracy in physical raw material tracing through multiple product transformations (i.e. from raw cotton to fabric)</li> </ul>



<b>Advanced technologies</b>	<b>Supporting role in traceability and transparency</b>
	<ul style="list-style-type: none"> <li>• Higher speed and automation</li> <li>• Lower costs in tracking data that is attached to products</li> </ul>

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**Box 2.3**  
**Blockchain pilot projects**

Among recent pilot projects supported by public funding is, “**Blockchain for Made in Italy Traceability**”. Launched by the Italian Ministry of Economic Development, and developed in collaboration with IBM, this project will assess the use of blockchain technology to implement traceability as a tool for promoting Made in Italy claims and anticounterfeiting. The public support was financial and organizational, the latter being especially relevant given the consultation activities needed in order to guarantee an inclusive approach.<sup>23</sup>

The UNECE **blockchain traceability pilot for organically farmed Egyptian cotton** is supported by EU financing and implemented in partnership with industry actors.<sup>24</sup> It aims to 1) Show the possible use of blockchain technology to support increased connectivity, higher cost-efficiency and strengthened due diligence and the technology’s ability to support sustainable sourcing for retailers, brands and manufacturers along the cotton value chain; 2) Demonstrate the capacity of firms operating in the cotton value chain to take risk-informed decisions and use a set of internationally agreed traceability and sustainability standards.

The pilot will cover traceability of sustainability characteristics across all the production steps of the value chain and includes the identification of relevant business and sustainability data as well as of key hotspots in the cotton value chain and related sustainability criteria and verification tools. When completed, a stakeholder group will assess the pilot’s scalability to other textile fibres. The pilot will also test the use of DNA markers to keep the connection between the physical and digital assets being traced with the support of blockchain technology.

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119. Given the large variety of available technology-based solutions for supporting traceability and transparency, it is important to have appropriate criteria for evaluating and selecting them. Some suggestions for possible “best practice” criterium are given in the table below.

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Table 2.4  
**Matrix of criteria for selecting technology-based solutions tools for traceability**

<b>Criteria/need for selecting technology-based solutions</b>	<b>Impact</b>
Ease of use (“user friendliness”)	A key factor in the uptake of technology and its correct application by users is the ease with which it can be used.

<sup>23</sup> Source: <https://www.mise.gov.it/images/stories/documenti/IBM-MISE-2019-INGLESE.pdf>  
<sup>24</sup> The pilot is implemented in collaboration with brands Hugo Boss, Stella McCartney, Vivienne Westwood and Burberry, raw material providers Alba-Group, Albini and Filmar, standard-setting bodies and technology providers GOTS, OEKO-TEX, ZDHC and in collaboration with Organic Cotton Accelerator, Textile Exchange, Cittadellarte Fashion B.E.S.T and the Italian Ministry of Economic Development and UNIDO.

<b>Criteria/need for selecting technology-based solutions</b>	<b>Impact</b>
Interoperability with a wide range of systems, platforms and technologies for the purposes of data collection, validation and publication	Interoperability is a key element in collecting and sharing data across multiple stakeholders and systems.
The use of existing international standards such as UN/CEFACT standards, for data acquisition, transmission and exchange	Data standards greatly facilitate interoperability and the exchange of data across systems.
The ability to use automatic rules in a system, and to efficiently change those rules as the environment evolves	Greater efficiency and the ability to modify a system based on experience and changes in the environment. The ability for implementing organizations to change decision parameters also reduces IT maintenance costs and reduces the risk of vendor “lock-in”
Virtual and physical training is available to support the use of technology solutions	Good quality training encourages actors’ engagement and good uptake
Simple, lean and accessible processes	Such processes are more cost-effective because of the reduced time and effort to achieve organizational goals and they are also more likely to be correctly implemented.
Technology solutions (such as IoT) that provide direct access to real-time information on sustainability in manufacturing processes, such as water, chemical and energy use.	Better, more accurate information about processes both for sustainability reporting and operations management
Differentiated information access rights, allowing the existence of a central data source but giving system owners the ability to give “reading and updating” rights according to the roles and interests of stakeholders.	More transparent sharing of information and efficient changes in the “sharing” status of data. For example, one NGO could be given information about current working conditions and another information about current water usage (but not working conditions).
Quick and efficient scaling solutions and partnerships	Cost effective implementation in systems where growth may lead to large numbers of stakeholders
Support for SMEs	Traceability which can be extended further up the value chain in order to include SME suppliers
Technology solutions that do not create “lock-ins” which make it difficult to change systems or suppliers	The ability to be more flexible and change systems in the light of evolving technology or needs – or if a given technology solution does not perform as promised.

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120. The above can be used as input into the specifications for a system. When developing purchasing (procurement) specifications and/or developing regulations that require

1015 technology it is best practice to define the requirements in a technology-agnostic way. This  
 1016 means defining the performance parameters that must be met and **not** specifying the use of  
 1017 any particular technology/ies. For example, one system performance requirement could be  
 1018 the processing of X number of transactions in Y time and with a maximum error rate of Z –  
 1019 or the ability to track goods back through 5 supplier tiers and 8 product transformations (for  
 1020 example the transformation from raw cotton into cotton thread). Specifications linked to a  
 1021 particular technology or version of a standard should be avoided in order to mitigate the risk  
 1022 of rapid obsolescence or irrelevance for systems and regulations.

1023 121. It is also important to keep in mind that while technology may provide useful tools, data  
 1024 quality and, therefore, system reliability, can be impacted by a number of non-technological  
 1025 factors. These include what information is captured, when and by whom as well as data-  
 1026 quality controls that are in place. Therefore, when designing traceability systems, regardless  
 1027 of the technology used, data accuracy and neutrality need to be a priority as well the  
 1028 auditability of the system.

## 1029 **F. Creating inclusiveness in traceability systems**

1030 122. In order to implement a resilient traceability framework and create shared value,  
 1031 policymakers and industry actors must be inclusive. This means addressing the digital divide,  
 1032 ensuring gender equality, supporting SMEs and taking into consideration the special needs  
 1033 of developing countries. How to approach inclusiveness in each of these areas is addressed  
 1034 in the sections below.

1035 123. In addition, when designing a traceability framework, in order to be inclusive, it may be  
 1036 necessary to take a differentiated approach to implementation. This means tailoring  
 1037 requirements to the capacity of value-chain partners based on “steps” which may go from a  
 1038 basic manual record-keeping process to one that is highly automated.

1039 124. Policymakers should also be approached since they can play a catalytic role in creating  
 1040 multi-stakeholder and multi-sectoral dialogues on inclusiveness as well as by supporting  
 1041 coordinated action. Multi-sectoral initiatives can make a special contribution by sharing the  
 1042 results of efforts already taken in other high-risk sectors such as agri-food, timber and  
 1043 minerals in order to address the issues described below.

### 1044 **1. The digital divide**

1045 125. Most of the technologies used in traceability and transparency systems are based upon  
 1046 the digital revolution and, therefore, pose the risk of deepening the digital divide between  
 1047 urban and developed country stakeholders and rural, low-income, and developing country  
 1048 stakeholders. In global trade, smaller actors who fail to keep up with the pace of digitalized  
 1049 processes could be undermined, resulting in substantial socio-economic impacts.

1050 126. From the outset, it is critical to consider several potential impediments to the use of  
 1051 technology, keeping in mind that the most important are often cost and access, followed by  
 1052 language and a lack of available training.

1053 127. Some actions that can, at least partially, address these concerns include making available  
 1054 low-cost devices and user-friendly<sup>25</sup> data collection tools to ensure that smaller actors (at  
 1055 farm and factory levels) in producing countries can provide the required information. In order  
 1056 to have efficient and effective tools, their design should take into consideration the language  
 1057 of users, communication channels and the provision of content which will build the  
 1058 confidence needed to support widespread use.

1059 128. Lastly, engagement and participation are important prerequisites for enabling  
 1060 technology. For all stakeholders, these can be strongly supported by solutions that are as  
 1061 simple as possible, easily accessible, cost-efficient, and flexible in their implementation. In

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<sup>25</sup> (Google, Microsoft) [https://www.microsoft.com/design/fluent](https://www.microsoft.com/design/fluent;);  
<https://www.microsoft.com/design/inclusive/>; <https://material.io/>

1062 addition, it is essential to have awareness-raising on the potential of technology and capacity-  
1063 building for using technology-based solutions

1064 129. In order to have a successful implementation of tracking and tracing across an entire  
1065 supply chain, it is important that an evaluation of stakeholder's technological readiness be  
1066 undertaken, and preliminary actions taken to alleviate any issues highlighted by these  
1067 evaluations.

1068 130. Policymakers and key industry actors also have a key role to play in scaling up  
1069 innovative solutions to these problems, as well as spurring coordinated action, collaborative  
1070 approaches, and partnerships in order to ensure the accessibility of technology at a global  
1071 scale for all stakeholders.

## 1072 2. Gender considerations

1073 131. The search for flexibility, higher productivity and low prices, have had two main results:  
1074 i) the outsourcing of textile and apparel work to developing countries and, 2) in all geographic  
1075 regions, the prevalence of women in the workforce – undoubtedly influenced by both the  
1076 image of the sector and the generalized practice of paying lower wages to women (UNEP,  
1077 2020). The clothing industry directly employs 60 to 75 million<sup>26</sup> people worldwide, of which  
1078 about 75 percent are women, which is a very substantial share of the industry's workforce  
1079 and of the support for the industry's economic growth. Nonetheless, only an exceedingly  
1080 small percentage of women reach management and supervisory roles.<sup>27</sup>

1081 132. As emphasized in the OECD Due Diligence Guidance for Responsible Business  
1082 Conduct,<sup>28</sup> gender-issues are a key element when implementing due diligence. As a result,  
1083 activities need to have tailored approaches for evaluating adverse impacts (human rights,  
1084 environment, health, etc.) which are specific to women in an industry where employment is  
1085 often precarious, informal or irregular.

1086 133. Supporting gender equality with traceability systems depends upon the claims being  
1087 made regarding gender and how these will be validated and registered in the traceability  
1088 system. Therefore, it is important to work with local partners to identify measurable  
1089 indicators. Some examples of gender-related claims are given in table 2.5.

1090 134. When deciding upon actions in support of gender equality it is essential to assess how  
1091 impacts may differ for women depending upon their circumstances, which may include  
1092 accumulated vulnerabilities (e.g. women who are also home-based workers, migrants,  
1093 minorities, etc.) and to consider women's specific positions at all stages of the production  
1094 chain.<sup>29</sup>

1095 135. To create real change will require supporting women's economic empowerment and  
1096 their promotion into leadership positions along value chains. Traceability and transparency  
1097 can have an impact by measuring the results of measures taken to reach these goals.

1098 Table 2.5

### 1099 Samples of gender-related Claims

<p>The apparel item (product/part/component) from <i>X suppliers</i> in <i>Y country</i> was manufactured in a factory which provides job opportunities for women in working conditions which comply with the standard Z.</p>
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<sup>26</sup> (UNECE-UN/CEFACT 2017) TEXTILE4SDG12 Transparency in textile value chains in relation to the environmental, social and human health impacts of parts, components and production processes.

<sup>27</sup> European Commission (2017) STAFF WORKING DOCUMENT – Sustainable garment value chains through EU development action.

<sup>28</sup> OECD (2018), OECD Due Diligence Guidance for Responsible Business Conduct.

<sup>29</sup> OECD (2018), OECD Due Diligence Guidance for Responsible Supply Chains in the Garment and Footwear Sector, OECD Publishing, Paris.

The apparel item from <i>X suppliers</i> in <i>Y country</i> was manufactured in a factory which has women in leadership and management positions based upon policies which comply with the standard Z.
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The apparel item (product/part/component) from <i>X suppliers</i> was manufactured in <i>Y</i> factory which endorses the standard Z promoting equal remuneration for women and men workers for work of equal value
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The imported apparel item (product/part/component) from <i>X suppliers</i> was manufactured in <i>Y</i> factory which has been audited as compliant with standard Z for the prevention of gender-based discrimination and violence in the workplace.
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### 3. Small- and medium-sized enterprises

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136. Traceability can be a costly activity and, when this is the case, it puts enterprises on an unequal footing depending upon their size, available resources and human capacity. On the other hand, systems for improved traceability and transparency can be beneficial to smaller actors, particularly SMEs, if they simplify the procedures, bring cost-efficiencies, add value and help the SME to upgrade their practices. One core principle for widespread uptake and participation in a traceability system is flexibility in its implementation and the avoidance of a one-size-fits-all approach. The goal of traceability is not to overwhelm actors in the value chain, it is to improve their sustainability footprint over the long-term in order to create a responsible and resilient industry.

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137. Small- and medium-sized enterprises (SMEs) account for a large share of companies in the industry, thus it is essential to consider their limited human and financial capacity prior to designing and implementing a traceability framework. To support this approach, UNECE-UN/CEFACT is proposing the use the traceability approach, taking into account the different capacities of smaller actors and larger enterprises. SMEs can be better integrated into a traceability system through a combination of financial and non-financial incentives such as increased market access, facilitated payments, specialized managerial and workforce training, infrastructure investment, fast-track processes and public visibility. Specific support also should be given to SMEs on technical and organizational aspects.

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138. When developing a traceability system there are also some specific actions needed in order to enhance the trust between value-chain partners, such as in-person meetings and in-the-field visits in order to have a clear view of what data is collected and by whom. Longer-term, stable contracts also ensure confidence by helping to re-assure participants with regard to the purpose of the data being collected.

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139. Civil-society organizations such as non-governmental organizations and trade unions also can play a key role in empowering actors by guiding and training local small stakeholders, not only to collect and enregister the data needed to meet the core requirements of a traceability framework, but also to showcase the value added of enhanced traceability and transparency to the local community in terms of social (labour conditions) and economic aspects (marketing and competitive assets).

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### 4. Integrating developing countries

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140. Global value chains in garment and footwear are scattered globally and upstream value-chain activities (from farming/cultivation and raw materials processing to manufacturing) are mainly undertaken in low and middle-income countries. When implementing traceability, low and middle-income countries' concerns must be considered. Much of what is said about inclusion for SMEs, also applies to low and middle-income countries, in part because the majority of their enterprises are SMEs. For example, just as for SMEs, in order to assure the effective functioning of a traceability and transparency solution, before implementation, an evaluation needs to be made of a solution's feasibility for actors located in the affected low and middle-income countries.

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141. Enhanced traceability and transparency can support efforts by developing countries to implement due diligence and to identify and mitigate adverse impacts related to sustainability hotspots such as pollution, excessive energy use and poor labour practices.

1143 142. It is also important to showcase, to national authorities, customs and industry  
1144 associations, the added economic value of traceability, transparency and sustainability as  
1145 tools for facilitating global market access and fostering domestic economies. For example,  
1146 traceability and transparency can highlight and prove a product's origin, content and quality  
1147 in order to attract a higher and fairer price. They also have the potential to support further  
1148 market access by showing compliance with international and regional standards. For  
1149 instance, being able to prove that a product meets the EU rules of origin may enable the  
1150 product to be exported tariff-free. In addition, there is an increasing competitive advantage  
1151 for producing and exporting countries if they can prove that they have taken action to support  
1152 improved environmental sustainability and working conditions through the enforcement of  
1153 internationally and acknowledged standards in social and labour sectors.

1154 143. Enterprises in low and middle-income countries need to be open to implementation and  
1155 willing to put forth effort for its implementation. In return, the price that the industry in  
1156 emerging economies receives for their goods needs to reflect this extra effort for traceability  
1157 and transparency.

1158 144. Governments and government authorities need to put in place an enabling environment  
1159 for traceability and transparency which comprises not only supporting regulations, but also  
1160 technical infrastructure (notably affordable Internet access and ICT services), support for  
1161 research and open-source technology solutions, and training for policymakers, officials and  
1162 smaller stakeholders.

1163 145. Intergovernmental and international organizations, finance institutions and national  
1164 development agencies have a key role to play in providing financial support for capacity  
1165 development activities and, in particular, for training on the implementation of international  
1166 standards.

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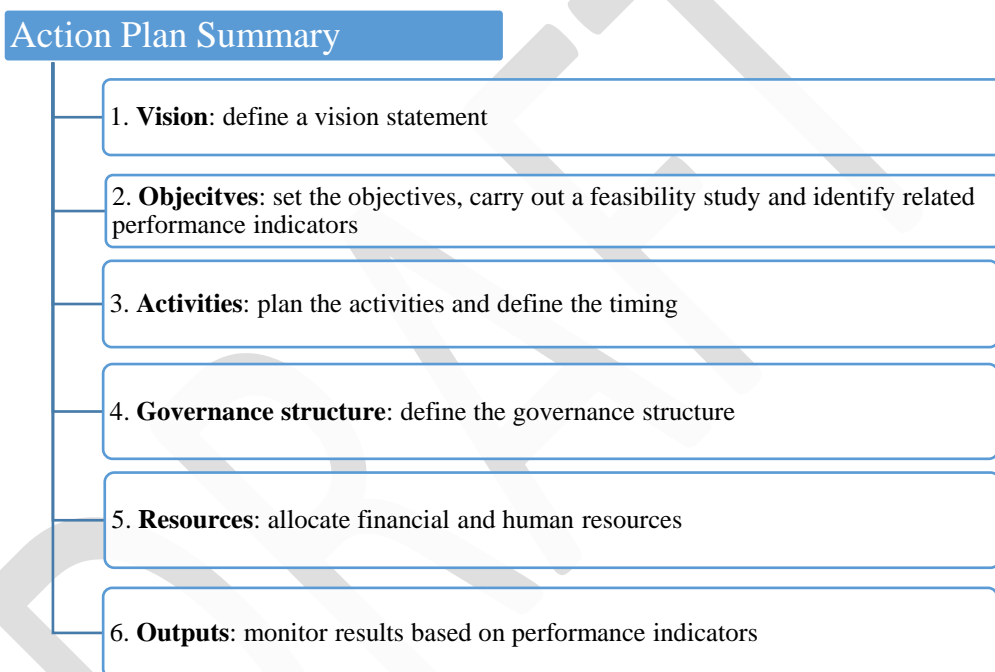
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1170 **Annexes**

1171 **Annex I**  
 1172 **Formulation and implementation of a traceability and transparency**  
 1173 **Action Plan**

1174 1. When setting and implementing a traceability and transparency system, companies should  
 1175 consider developing an Action Plan in order to define a vision with specific objectives,  
 1176 corresponding activities, and key performance indicators. Such an Action Plan should also  
 1177 define a governance structure for implementing the foreseen activities, a budget for the  
 1178 needed financial and human resources, and mechanisms for monitoring and communicating  
 1179 progress against the defined performance indicators and timeframes. These steps are  
 1180 summarised in Figure A.2 below and are described in more detail in the remainder of this  
 1181 annex.<sup>30</sup>

1182 Figure A.1  
 1183 **Action plan summary**



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 1185 **1. Define a vision statement**

1186 2. The vision statement summarizes the objectives of a traceability and transparency system  
 1187 and the benefits for the stakeholders involved. The aim of the vision statement is twofold: it  
 1188 provides guidance and direction, and it serves as inspiration and a source of motivation. It  
 1189 should start from and be consistent with the overall corporate sustainability strategy since  
 1190 traceability and transparency are key enablers of higher sustainability performance and more  
 1191 efficient value-chain management.

- 1192 • *Example: Our vision is to promote the application of the highest social,*  
 1193 *environmental and health & safety principles during the creation of products for our*  
 1194 *customers, throughout our entire value chain.*

<sup>30</sup> UNECE (2015): Guide to drafting a National Trade Facilitation Roadmap:  
<https://www.unece.org/fileadmin/DAM/trade/Publications/ECE-TRADE-420E.pdf>

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- 2. Set the objectives, carry out a feasibility study and identify related performance indicators**
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3. The objectives define more in detail the future outcome that needs to be accomplished. Each objective contributes to the achievement of the vision statement. Objectives contemplated in the Traceability and Transparency Action Plan should be specific, measurable, attainable, relevant and time bound (SMART). The plan should be developed on the basis of a gap analysis, identifying the main requirements for a traceability system implementation and related resource needs. It should also set performance indicators to monitor and assess the achievement of the objectives or their results (i.e. Key Performance Indicators (KPIs)).
- 1205 • *Example: The number of value-chain steps with an identified and verifiable sustainability claim as a percentage of the total number of value-chain steps.*
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  - 1207 • *Example: The number of tracked value chain steps for each material and semi-finished/finished product against the total number of value-chain steps.*
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  - 1209 • *Example: The number of identified and disclosed value-chain partners against the total number of value-chain partners.*
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4. When formulating sustainability claims for products and their processes, the firm must clearly link them to the traceability and transparency objectives defined in the Action Plan, as well as to their verification criteria, data requirements, and related performance indicators. All of these elements are required in order to a vision of increased sustainability performance through improved traceability and transparency.
- 1216 • *Example: Attain full traceability for the top 30% of our products, by collecting information about products and process characteristics, throughout the whole value chain, within 3 years.*
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  - 1219 • *Example: Achieve full transparency for the top 30% of our products by providing easy access, clarity and regular updates about suppliers' compliance with our company's sustainability goals, throughout the whole value chain, within 3 years.*
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- 3. Plan the activities and define the timing**
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5. The Action Plan needs to define how the objectives will be achieved, in other words, which activities should be implemented. In the context of the Action Plan, an activity is a specific action or project that will implement a traceability and transparency tool or solution.
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6. Implementing a traceability and transparency system shall be considered with a long-term view.
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7. Typical decisions concerning activities to achieve a *traceability objective* are about:
- 1229 • The different types of information related to traceability that should be collected and recorded as well as by whom and how
  - 1230
  - 1231 • Which specific information needs to be shared, with who and how
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  - 1233 • How frequently information will be shared
  - 1234 • Which technologies will facilitate the collection and sharing of information
  - 1235 • How should information be stored (according to who needs to have access to the data and how often)
  - 1236 • The performance indicators to be monitored
  - 1237 • When the content of the information should be reviewed
  - 1238 • How to best communicate information to end consumers to inform their decision-making.
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8. Typical decisions concerning a *transparency objective* are the same as for traceability information but are about the information needed to verify sustainability claims – so one of the key additional questions for transparency is, “What information do we need in order to verify our claim?”.



1244 9. In addition, the following key considerations are important: easy access, clarity and  
 1245 regular updates. The examples below<sup>31</sup> refer to effective disclosure when publishing value-  
 1246 chain facility information, but can be easily extended to activities to enhance transparency of  
 1247 the value chain:

- 1248 • It is important to guarantee easy access to information by making information easily  
 1249 and freely accessible on websites; and making information available in formats that  
 1250 are downloadable files and enable machine-readable searches.
- 1251 • It is important to guarantee clarity in the disclosure by: clearly stating what precisely  
 1252 is being published and what definitions are being used; clearly stating whether all  
 1253 authorized subcontractors used by cut-make-trim factories for processes to complete  
 1254 a brand’s products are included; indicating the aggregate volume of business that is  
 1255 captured by the disclosure and the percentage of total supplier factories published;  
 1256 indicating exclusions from disclosures, if any, and impending plans to expand  
 1257 disclosures.
- 1258 • It is important to guarantee regular updates by: specifying the date when the  
 1259 information was last updated and how frequently the information is publicly updated;  
 1260 communicating achievements should not be considered a marginal activity since it is  
 1261 needed to justify the traceability claims, to educate consumers and to inspire other  
 1262 industry players with the final goal of improving garment and footwear sustainability  
 1263 performance.

1264 10. Some examples of related objectives are below.

- 1265 • *We will invest (amount)EUR in advanced traceability technologies to reduce time*  
 1266 *and cost, increase the accuracy and speed of data and allow product authentication...*
- 1267 • *Next year we will conduct (x) number of audits for traceability, which will allow us*  
 1268 *to identify inefficiencies, enable improved control and monitoring of product quality,*  
 1269 *have better recall management by identifying the origin of defects, and enhance*  
 1270 *coordination among actors of the supply chains...*
- 1271 • *Next year we will carry out (x) individual meetings with suppliers in our production*  
 1272 *clusters, concerning specific aspects of traceability in their supply chain.*
- 1273 • *In total, next year (x) suppliers will be provided with training on the subject of*  
 1274 *traceability and transparency of value chains in collaboration with our sustainability,*  
 1275 *product development, marketing and purchasing teams.*
- 1276 • *By the end of next year we will make information about (x) suppliers available easily*  
 1277 *and freely on our website.*

1278 **4. Define the governance structure**

1279 11. The Action Plan should include an outline of the governance structure required to  
 1280 manage and implement the activities. The detailed governance structure and the functions  
 1281 and composition of the Steering Committee will vary from company to company, in  
 1282 accordance with a company’s organizational charts for sustainability related functions. In  
 1283 general, a governance structure should report to the top management of a company, to ensure  
 1284 that sustainability objectives are integrated into staff responsibilities and the functions of  
 1285 managers and staff at all levels.

1286 12. The ideal structure in a “vertical” organization consists of a Steering Committee that  
 1287 depends directly on the Head of Sustainability and includes representatives from each  
 1288 department/function that is involved in the implementation, monitoring and communication  
 1289 of identified activities and achieved results. The ideal structure in a “horizontal” organization  
 1290 consists of an interconnected network of representatives from each department/function,  
 1291 including the Head of Sustainability, coordinated by a Steering Committee. The  
 1292 departments/functions that are involved in the implementation of each activity, such as

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<sup>31</sup> Transparency Pledge: <https://transparencypledge.org/good-practices-regarding-company-disclosures/>

1293 product development, operations (including quality control), marketing and communication,  
1294 should be appointed, and the working groups to manage activities and projects should be  
1295 formed.

1296 13. Also, from the beginning, it is important to include activities that focus on stakeholder  
1297 communication and collaboration: this will ensure that all traceability stakeholders  
1298 understand the common objectives and the scope of the activities in the Action Plan.

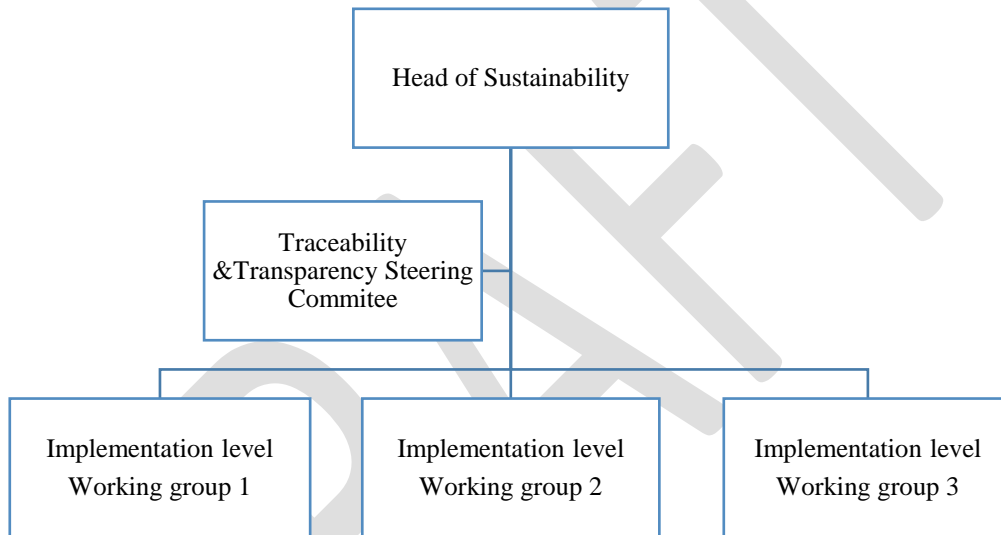
1299 14. Sample governance structures are shown in Figure A.2.

1300 **5. Allocate resources**

1301 15. This section of the Action Plan should describe the necessary human and financial  
1302 resources needed for the implementation of the activities, as well as the overhead budget for  
1303 the management of the Action Plan. Allocating human and financial resources, with a  
1304 detailed, results-based budget, ensures that the Action Plan is linked to a commitment to  
1305 allocate the resources needed for its implementation.

1306 Figure A.2

1307 **Sample governance structure: vertical organization**



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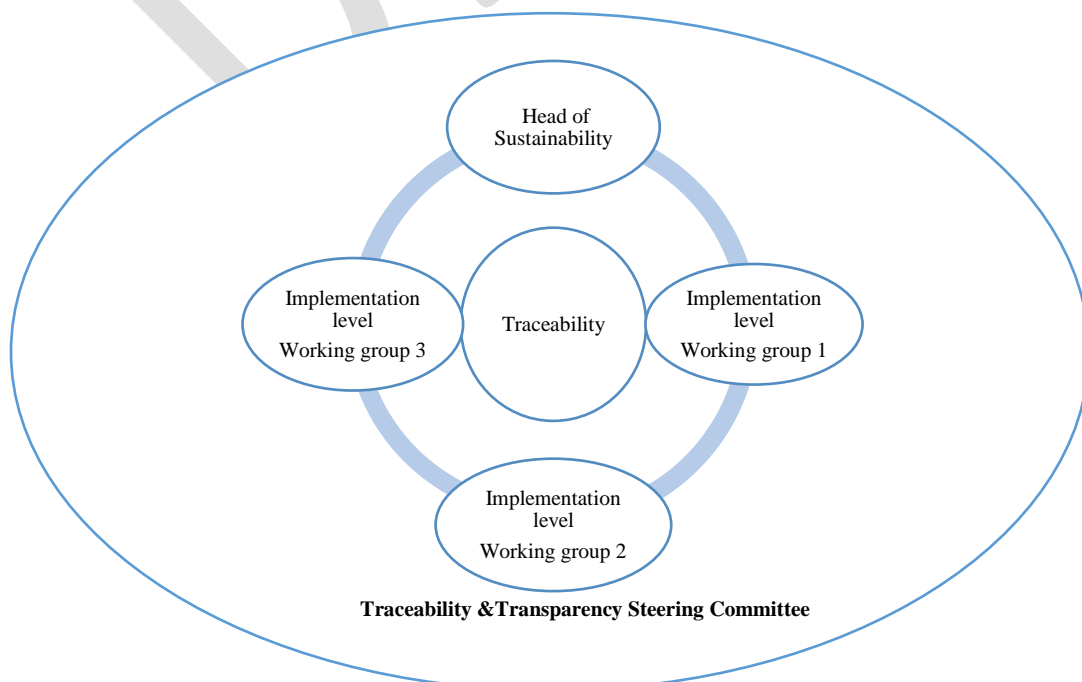
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**Sample governance structure: horizontal organization**

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**Traceability & Transparency Steering Committee**

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**6. Monitor results**

16. Monitoring and evaluation against predefined performance indicators are core elements of an Action Plan.

17. Performance indicators to measure progress against expected accomplishments, will vary according to the actors and the role they play in the value chain. Setting performance indicators should start from identifying the main traceable assets linked to sustainability claims, based on the results of the risk-analysis of the value chain.

18. Traceability related indicators could measure the level of traceability of selected products, with their parts and components (traceable assets) along the value chain, e.g. number of business processes covered. Transparency related indicators should cover the disclosure of information about the selected traceable asset, e.g. names and addresses of suppliers’ production facilities and information that can be used to verify conformity with sustainability principles (such as certifications and audits or other controls).

**Examples**

**1. Vision**

Our vision is to promote the application of the highest social, environmental and health & safety principles during the creation of products for our customers, throughout our entire value chain

**2. Objectives**

- 2.1 Attain full traceability for the top 30% of our products, by collecting information about products and process characteristics, throughout the whole value chain, within 3 years
- 2.2. Achieve full transparency for the top 30% of our products by providing easy access, clarity and regular updates about suppliers factory information, throughout the whole value chain, within 3 years

**3. Performance indicators**

- 3.1 Number of value-chain business processes covered by the traceability system
- 3.2 Number of suppliers for which information is made available and accessible on the website,....

**4. Activities**

- 4.1. We will invest (amount)EUR amount in advanced traceability technologies to reduce time and cost, increase the accuracy and speed of data and allow product authentication...
- 4.2. Next year we will conduct (x) number of audits for traceability, which will allow us to identify inefficiencies, enabling control, the monitoring of product quality and recall management to identify the origin of defects and enhance coordination among actors of the supply chains...
- 4.3. Next year we will carry out (amount) individual meetings with suppliers in our production clusters, concerning specific aspects of traceability in their supply chain.
- 4.4. In total, next year (x) suppliers will be provided with training on the subject of traceability in collaboration with our purchasing teams.
- 4.5. By the end of next year we will make information available about (x) suppliers, by making information easily and freely accessible on the website...

**5. Governance structure**

- 5.1 Vertical vs horizontal governance structure

**6. Resources**

- 6.1 Human and final resources in support of the activities to be detailed in an annexed budget

**7. Outputs**

- 7.1. Through investments in advanced technologies we were able to increase the accuracy and speed of data exchange by (xx) and allow product authentication across our value chain.
- 7.2. Through the increased number/alignment of audits for traceability we were able to publish verification data for at least 30% of our products.
- 7.3. The meetings with suppliers resulted in an agreement on the design of a joint traceability system.
- 7.4. The increased transparency resulted in higher ranking in (xx) **the** Transparency Index.

1328

1329 19. Such indicators could be combined in a *Traceability and Transparency Index* to measure  
1330 a company's performance in collecting and sharing relevant data and information with key  
1331 value-chain actors and supporting sustainability claims.

1332 20. Enhanced traceability and transparency of the value chain allow more informed  
1333 management decisions about the selection of value-chain partners; enhanced compliance  
1334 with legal, regulatory and reporting requirements; enhanced access to public incentive  
1335 systems for advancing the green and circular economy; and better management of  
1336 reputational risk . As a result, related KPIs concern, for example: reduction of system  
1337 integration costs; reduction of number of lawsuits or sanctions; reduction of intermediation  
1338 costs; reduction of number of quality related issues.

## 1339 7. Communicating the results and related recommendations

1340 21. Communication supports learning and success, internally with value-chain partners and  
1341 customers, and also with the public at large. Communication methods can range from  
1342 incorporating reporting and communication requirements on the implementation of the  
1343 Action Plan into the overall sustainability strategy; to the establishment of reporting  
1344 mechanisms to monitor progress, such as a Traceability and Transparency Index; to the  
1345 sharing of good practices and lessons learned across relevant multi-stakeholder industry  
1346 platforms and initiatives.

1347 22. The **drafting process** for an Action Plan has three major phases (see figure A.3):

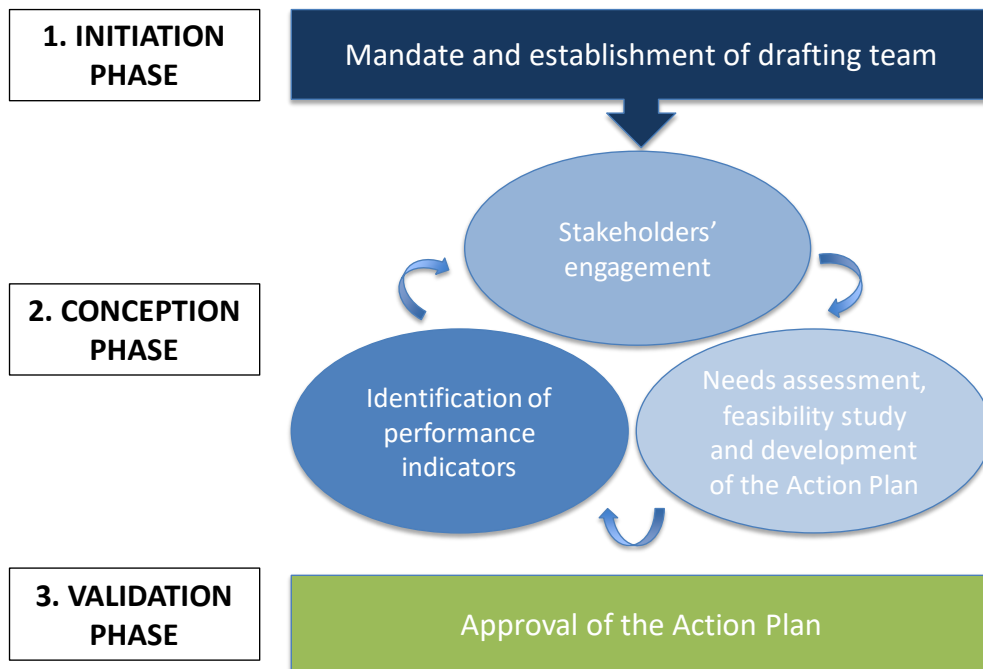
1348 (a) **Initiation Phase**, where the Head of Sustainability needs to request the  
1349 development of a document that describes the Traceability and Transparency strategy.

1350 (b) **Conception Phase** that consists of drafting the document itself. It includes three  
1351 stages: 1) engaging stakeholders, 2) discussion with stakeholders on existing issues and  
1352 possible activities to be undertaken as well as 3) defining the performance indicators to  
1353 measure the achievements and results of the different activities. The outcome of the second  
1354 phase is a consolidated draft Action Plan document.

1355 (c) **Validation Phase**, where the document is presented to the internal decision  
1356 makers in order to receive formal endorsement to start the implementation of the activities  
1357 included in the Action Plan.

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Figure A.3  
**Three-phase model for the drafting process of a Traceability and Transparency Action Plan**



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23. “The three phases “Initiation”, “Conception” and “Validation” are sequential, meaning they are only executed once and in this order. At the same time, the three stages in the Conception phase - engaging stakeholders; assessing needs, identifying objectives and activities and conducting a feasibility study; and defining performance indicators - are iterative in nature and may need to be repeated several times. Each stage can unveil further issues in the processes, or new proposals for how to address them. As a consequence, it might be necessary to revisit previous findings, to redefine the corresponding activity or include new ones, to reconsider the performance indicators and to (re-) engage stakeholders.”

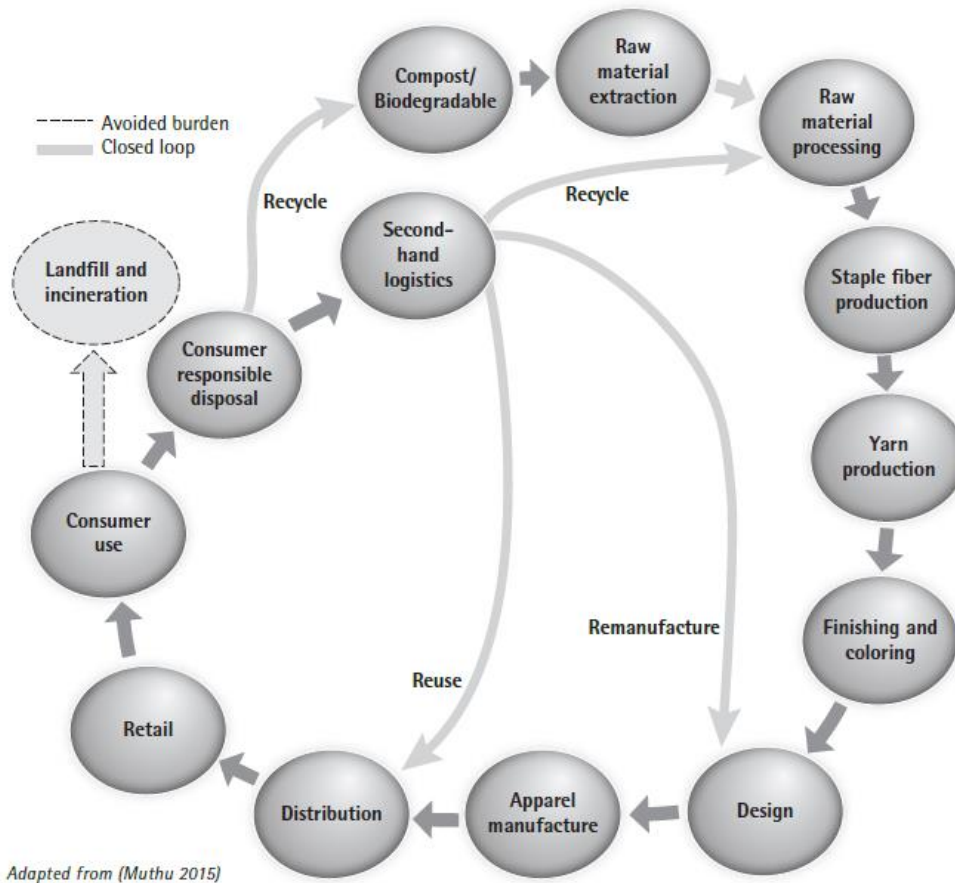
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**Annex II  
Glossary**

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**Circularity** of a production process refers to the ability of such process to retain the value of products, materials and resources in the economy for as long as possible

**Figure A2.1 Circularity in textile and footwear value chains**



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Source: Rusinek, M. et al., 2018<sup>32</sup>

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**Claim** is a high-level statement about a characteristic of a product, or about a process or an organization associated with that product (traceable asset). In order to show that the characteristic is true, it is necessary to trace the asset as it moves through the value chain, *ECE/TRADE/429 (2016) Traceability for Sustainable Trade*.<sup>33</sup>

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**Code** is a character string (letters, figures or symbols) that for brevity and/or language independency may be used to represent or replace a definitive value or text of an attribute. Codes usually are maintained in **code lists** per attribute type (e.g. colour).

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**Due Diligence** is an ongoing, proactive and reactive process through which enterprises can prevent and mitigate adverse impacts related to human rights, labour rights, environmental protection, and bribery and corruption in their own operations and in their supply chains. *OECD 2018*.<sup>34</sup>

<sup>32</sup> Blockchain for a Traceable, Circular Textile Supply Chain: A Requirements Approach (2018), M. J. RUSINEK, H. ZHANG, N. RADZIWILL, 4 SQP VOL. 21, NO. ASQ.

<sup>33</sup> UNECE, Traceability for Sustainable Trade, A Framework to Design Traceability Systems for Cross Border Trade, ECE/Trade/429, <http://www.unece.org/index.php?id=43763>

<sup>34</sup> OECD (2018): OECD Due Diligence Guidance for Responsible Supply Chains in the Garment and Footwear Sector.

- 1390 **Economic Operator** is a business or other organization which supplies goods, works or  
1391 services within the context of market operations. The term is used in public procurement to  
1392 cover suppliers, contractors and service providers.
- 1393 **Entry and Exit Points** are the events (activities) at the start and the end of the traceability  
1394 process within the value chain. At each of these points the traceable asset needs to meet  
1395 specified criteria.
- 1396 **Unique Identifiers (IDs)**, information collected to follow the path of a traceable asset, that  
1397 is linked to it. The traceable asset must have a unique Identifier (ID). IDs are also required  
1398 for all of the traceability/transparency components that information is collected about;  
1399 examples include, enterprises, locations, processes and transportation units.
- 1400 **Logistics Units** contain traceable assets for transport and/or storage. Most often they contain  
1401 aggregated traceable assets but logistic units may also contain disaggregated traceable assets.  
1402 Logistics units are given IDs in order to follow the traceable assets they contain. This is done  
1403 by recording the IDs of the traceable asset(s) and linking them to the ID of their logistics  
1404 unit.
- 1405 **Materials** are raw, unprocessed substances
- 1406 **Products** are processed, finished items that are offered for sale. That is, they are  
1407 manufactured combinations of materials and perhaps other products, processed to create  
1408 items
- 1409 **Product Certification** is the process of certifying that a certain product has passed  
1410 performance and quality assurance tests, or qualification requirements stipulated in  
1411 regulations.
- 1412 **Sustainability**, in this context, is understood as the manufacturing, marketing and use of  
1413 garment, footwear and accessories, and its parts and components, taking into account the  
1414 environmental, health, human rights and socio-economic impacts, and their continuous  
1415 improvement through all stages of the product's life cycle.
- 1416 **Sustainability Claims** to support sustainable development objectives should be selected  
1417 based on a value-chain risk analysis, corporate objectives, and a company's commitment to  
1418 responsible business conduct and due diligence. The contents of the claim should be  
1419 accessible and may need to comply with legal requirements. Also, some organizations that  
1420 develop sustainability standards and guidelines have rules about how they can be referenced  
1421 in claims.
- 1422 **Sustainability Criteria** can be a standard, a guideline or other document which describes  
1423 the characteristics that a product or process must have in order to conform with the "claim".  
1424 The criteria are what an auditor compares information against to determine if due diligence  
1425 has been followed in ensuring a claim.
- 1426 **Track and Trace (TT) standard**
- 1427 **Traceable asset** is any product or material [individually, in batches or in trade units] that  
1428 needs to be tracked along a value chain. Within garment and footwear it is, "any item (for  
1429 example an object, a product or other traded item or a service) that needs to be tracked along  
1430 a supply chain." (UNECE Traceability for Sustainable Trade Guide).<sup>35</sup> It can also be thought  
1431 of as the unit that one wants to trace or record information about in a traceability system.
- 1432 **Traceability** is understood as "the ability to trace the history, application or location of an  
1433 object" in a supply chain (ISO, 2015).<sup>36</sup> In this context, it is defined as the ability to "identify  
1434 and trace the history, application, location and distribution of products, parts and materials,  
1435 to ensure the reliability of sustainability claims, in the areas of human rights, labour  
1436 (including health and safety), the environment and anti-corruption" (UN Global Compact

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<sup>35</sup> Idem.

<sup>36</sup> ISO 9001:2015, Quality Management Systems - Requirements

1437 2014);<sup>37</sup> and “the process by which enterprises track materials and products and the  
1438 conditions in which they were produced through the supply chain” *OECD, 2018*<sup>38</sup>.

1439 **Traceability Framework** is the entire ecosystem supporting value-chain traceability  
1440 including policies, systems, support, and promotion. It covers the use of traceability across  
1441 the entire value chain – from the extraction and processing of raw materials, to finished  
1442 product branding and retailing, consumption and post-consumption activities.

1443 **Traceability Model** refers to the organization of a value chain in order to ensure that  
1444 traceability can be implemented. There are different traceability models, whose usefulness  
1445 depends upon the type of product and the claims being made. Examples of traceability models  
1446 which can be applied to products and processes throughout the entire value chain are product  
1447 segregation, mass balance and book and claim.

- 1448 • **Product Segregation:** The preferred model for a traceability system is product  
1449 segregation. The objective is to have products produced according to the same  
1450 sustainability standard are strictly separated from other products. With product  
1451 segregation there is a physical separation of certified materials and products from  
1452 non-certified materials and products at each stage in the value chain. This ensures that  
1453 certified and non-certified materials and products are not mixed and that the end  
1454 product comes from a certified source.
- 1455 • **Mass balance:** In the Mass-Balance model, products from both sustainable and non-  
1456 sustainable sources are mixed, but as they move through the supply chain an exact  
1457 account is kept of the volume ratios. The purpose is to guarantee that the amount of  
1458 sustainable content claimed is equal to the amount of sustainable products or  
1459 materials used. This model is commonly used for products and commodities where  
1460 segregation is very difficult or impossible to achieve, such as for cocoa, cotton, sugar  
1461 and tea.
- 1462 • **Book and Claim:** In the book-and-claim method there is a free flow and mixing of  
1463 certified and non-certified assets, with no segregation of assets, so it is actually a  
1464 mixed product that is sold. Instead, a producing company can obtain sustainability  
1465 certificates for the volume of goods that it puts into the value chain which are certified  
1466 as following a good practice. This model is typically used when the production and  
1467 market conditions make it impractical to sell certified product that has been  
1468 segregated from non-certified product. This model is used for soy and palm oil.

1469 **Traceability Rules** describe how the business processes between an Entry Point and an Exit  
1470 Point need to be organized so that the Claim is met.” *ECE/TRADE/429 (2016) Traceability*  
1471 *for Sustainable Trade*.<sup>39</sup>

1472 **Traceability System** refers to all of the practical processes, procedures and technology  
1473 needed to create a functional traceability system. It does not refer to the surrounding  
1474 ecosystem with its policies, incentives, promotion, etc. A *traceability system* together with  
1475 its surrounding ecosystem of supporting policies, incentives and promotion measures, forms  
1476 a *traceability framework*.

1477 **Trade Unit** is a unit used in trade; for example, the unit shown on an invoice which could  
1478 be, among many options, a “package” or a “bale” or a “container” – this depends upon the  
1479 product and the trading partners.

1480 **Transparency** relates directly to relevant information been made available to all elements of  
1481 the value chain in a standardized way, which allows common understanding, accessibility,  
1482 clarity and comparison. *European Commission 2017*.

1483 **UN/CEFACT Core Component Library** is the part of the registry/repository in which Core  
1484 Components shall be stored as Registry Classes. The Core Component Library will contain

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37 United Nations Global Compact Office (2014), A Guide to Traceability A Practical Approach to Advance Sustainability in Global Supply Chains.

38 OECD (2018): OECD Due Diligence Guidance for Responsible Supply Chains in the Garment and Footwear Sector.

39 Idem.



1485 all the Core Component Types, Basic Core Components, Aggregate Core Components, Basic  
1486 Business Information Entities and Aggregate Business Information Entities.

1487 **UN/CEFACT Modelling Methodology (UMM)**

1488 (a) Most activities can be decomposed into business processes that are more generic  
1489 to a specific type of business (UN/CEFACT)

1490 (b) The UMM Meta Model is a mechanism that allows Trading Partners to capture  
1491 the details for a specific business scenario using a consistent modelling methodology.

1492 **Use case** is the specification of a sequence of actions, including variants, that a system (or  
1493 other entity) can perform, interacting with actors of the system. See use-case instances. A  
1494 use-case class contains all main, alternate flows of events related to producing the  
1495 “observable result of value”. Technically, a use-case is a class whose instances are scenarios.

1496 **Verification Criteria** are the standards and key performance indicators that traceable assets  
1497 are supposed to meet and the rules for the supporting traceability process. These criteria are  
1498 the basis upon which verification processes are carried out by auditors or other verification  
1499 agencies in order to prove that the traceable assets have complied with relevant claims.

1500 **Verification Process:** a verification is “confirmation of a claim, through the provision of  
1501 objective evidence, that specified requirements have been fulfilled”. In the context of  
1502 traceability, the verification process is carried out by a verification (audit) body that analyses  
1503 traceability events and validates the information about them against the verification criteria  
1504 and any other transparency system rules.

1505 **XML Schema**

1506 (a) An XML schema is a document that describes the valid format of an XML dataset.  
1507 This definition include what elements are (and are not) allowed at any point what the  
1508 attributes for any element may be the number of occurrences of elements.

1509 (b) A generic term used to identify the family of grammar-based XML document  
1510 structure validation languages to include the more formal W3C XML Schema Technical  
1511 Specification, Document Type Definition, Schematron, Regular Language Description for  
1512 XML.

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