UNECE-UN/CEFACT "Enhancing Transparency and Traceability for Sustainable Value Chains in Garment and Footwear"

UNECE Policy Recommendation on Transparency and Traceability for Sustainable Garment and Footwear Value Chains

II. Guidelines for Recommendation n°XX on enhancing transparency and traceability for sustainable garment and footwear value chains

Contents

A. INTRODUCTION

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

Transparency requires companies to know what is happening upstream in the supply chain and to communicate this knowledge to both internal and external stakeholders. Indeed, more and more consumers are insisting upon value-chain transparency for the products they buy and, in some cases, they also are willing to pay more for brands that provide this information.[1]

Traceability is an essential tool for creating transparency and has been defined by ISO as "the ability to trace the history, application or location of an object" in a supply chain (ISO, 2015). In other words, traceability allows you to identify where assets are as they move through a value chain and, when you have a final product, to identify all of the "assets" that were used to make that product and where their origins.

These Guidelines support the use of traceability to create the transparency required for substantiating claims or statements that support more sustainable products, services, or business processes.

The Guidelines look at three levels of traceability planning and design (Figure 2.1)

The traceability framework presented here covers traceability across the entire value chain - from the extraction and processing of raw materials, to finished product branding and retailing, consumption and post-consumption activities. In addition, the Guidelines also propose a step-by-step approach, a roadmap, for the development and implementation of a traceability framework both at the industry and government level.

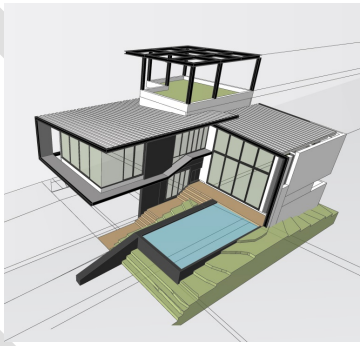
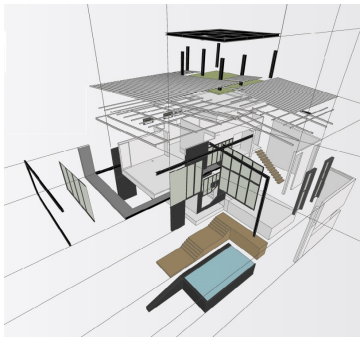
The Guidelines start with the traceability principles which should underly and support a traceability framework. It then briefly describes the principle components of a traceability system and, from there, launches into an in-depth description of the traceability architecture.

Having provided a solid foundation as to how a traceability system works, the Guidelines then look at the wider framework covering cost allocation and incentive systems, the role of advanced technologies, data collection and analysis, reporting, and making systems inclusive.

To conclude, the final section of the Guidelines looks at how, from a practical standpoint, a government or organization can develop a roadmap or implementation plan for a traceability framework.

[1] 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)

Figure 2.1 Three levels of traceability planning and design

Three Levels of Traceability Planning and Design		
The Traceability **Framework**	**The entire ecosystem supporting value-chain traceability including policies, systems, support, and promotion.** An analogy could be a village or city in which people live and work. Within the Ecosystem one finds home and offices as well as other supporting structures such as roads, water and sewage systems, telephone/data lines, etc.	 Background vector created by veraholera - www.freepik.com
The Traceability **System**	Is one element of an ecosystem and consists of **all the practical processes, procedures and technology that make up a functional traceability system.** An analogy could be a house or an office building which directly supports human activities and is the practical, functional interface of the ecosystem with users.	 Background vector created by archjoe - www.freepik.com
The Traceability-System **Architecture**	**Is the description of the fundamental components of a traceability system and is called an "architecture" because it explains how a system is built.** An analogy could be describing the components of a building.	 Background vector created by archjoe - www.freepik.com

B. TRACEABILITY PRINCIPLES

In order to develop and implement an efficient and effective traceability framework in the garment and footwear industry, a number of guiding principles should be taken into consideration:

1. **Awareness**: Key stakeholders and industry actors need to be well aware of the benefits of traceability systems in terms of enhanced regulatory compliance and corporate value.

2. **Knowledge**: A clear understanding of the purpose of a traceability system, its scope, and the information needed in order to promote sustainability and circularity in consumption and production processes. This includes the information which should be collected and exchanged ("what"), by which actors ("by whom"), at which stages of value chain ("where"), and at which time ("when").

3. **Risk-based analysis:** In order to maximise impact and make the best use of limited resources, traceability systems should be focussed on areas where there is the highest risk of non-sustainable practices. These high-risk areas differ between products and value chains, so an in-depth risk analysis is needed at the start of the planning and implementation process.

4. **Commitment**: Policy and decision makers need to commit to traceability in the entire industry value chain - from extraction and processing of raw materials, to finished product branding and retailing, to consumption and post-consumption activities, and such commitment must be embedded into policy and legal frameworks as well as corporate strategies for sustainability and circularity.

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

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

7. **Norms and standards**: Traceability systems are of greatest value if they are implemented using relevant norms and standards, including for the data to be collected and exchanged. Therefore, implementation should be based on available, recognised norms and standards for data, implementation and certification of traceability in order to favour the harmonisation of concepts, approaches and terms, and the interoperability of systems.

8. **Appropriate technology**: Tools and operating infrastructure to support effective traceability are a key enabling factor. The technologies used should be interoperable and support for their use must come from all actors along the value chains and, when required, support must also be given to actors so that all value-chain participants have access to the required technologies.

9. **Inclusiveness:** Traceability systems need to be inclusive, in order to integrate all stakeholders including small and medium- sized companies, disadvantaged groups (such as minorities and women) and less advanced economies. Acceptance and support for a traceability system depends on its capability to integrate these stakeholders.

C. KEY TRACEABILITY SYSTEM CONCEPTS

As described in the introduction, **"Traceability system" refers to all of the practical processes, procedures and technology needed to create a functional traceability system.** It does not refer to the surrounding ecosystem with its policies, incentives, promotion, etc. A traceability system together with its surrounding ecosystem forms a traceability framework.

Value-chain actors in the garment and footwear industry need to perform due diligence in order to ensure that their products are not made in a way that damages the environment or results in unacceptable social conditions. The most effective way to do this is through traceability systems that monitor and, as needed, report on garment and footwear products, parts and components throughout the value chain moving from extraction, production, transformation and shipment processes to the collection and recycling of used products.

Traceability systems support ***policy claims*** about the characteristics of a product or process and collect data to validate these policy claims based upon defined ***verification criteria***. To do this, a system needs to:

- Identify a series of ***traceable assets*** which can start with raw materials and end with final products
- Mark/tag each of these traceable assets with unique ***identifiers (IDs)***
- Record and link to these IDs ***Sustainability information*** that will support the verification criteria as the traceable assets move between the ***entry and exit points*** for traceability in the value chain
- ***Have a verification process,*** carried out by auditors, which verifies that the data collected is accurate, aligned with the verification criteria and supports the policy claims.

The key concepts used in describing a traceability system are highlighted in the above text and their definitions, as used in these Guidelines, can be found in the following table. Then, in the following section, on Traceability System Architecture, we look at these concepts, and some additional, complementary traceability system components, in more detail – also exploring how they work together.

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). The most commonly referred to definition from a scientific paper says, "Traceability is the ability to track a product batch and its history through the whole, or part, of a production chain from harvest through transport, storage, processing, distribution and sales" (Moe, T. (1998). Perspectives on traceability in food manufacture. Trends in Food Science & Technology, 9, 211e214).

A "traceability system" is one that implements traceability as described in one of the three 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 defense use evidence to prove the facts of the case.... A primary means of authenticating an item involves analyzing 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."[1]

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 synonomous (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, to avoid confusion, in these Guidelines

- **"Traceability" is defined according to the definitions in ISO standard 8402 and the scientific paper by Moe. T. (1998) as quoted above**
- **"Traceability system" means the practical system of processes, procedures and information exchanges that implements traceability and**
- **"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 (the documentation coming from a traceability system).**

Table 2.1 Key Traceability system concepts

KEY TRACEABILITY SYSTEM CONCEPTS		
Policy Claim	*Why traceability?* *Which objective does it fulfil?* *What is its objective?*	A policy claim is a high-level statement about a characteristic of an identified product (traceable asset) or a process associated with that product, where, in order to show that the characteristic is true, it is necessary to trace the asset as it moves through the value chain. *For example,* the claim that a product is "sustainably produced", "organic" or contains "recycled-content".[2]
Traceable asset	*What is being traced?*	The policy claim should be linked to a traceable asset, which is the product to be traced. The traceable asset can be defined at different levels: • Individually (for example a single garment) • In "trade units" which are quantities used for buying and selling (for example a package of shirts or a container-load of thread) • 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 thread produced by one machine during one day). A trade unit may contain one batch(where that is the trade unit), more than one batch (for example in a container-load of fabric) or less than one batch when a batch is split across multiple trade units (for example a package with 3 different coloured shirts). The choice of which traceable assets to use will depend upon the objective(s) of a traceability system as well as the processes in the value chain and the capabilities of value-chain partners.
Verification criteria (including the definition of the traceability	*Why should anyone believe the policy claim?* *What proof exists that it is true?*	Verification criteria define the scope of the verification process (see below). In line with the ISO definition3, the criteria/scope include: i) A clear definition of the policy claim (object) to be verified (for example for a claim of 100% organic cotton is 98% or 95% acceptable?) ii) The applicable process for verification and (for example, which data needs to be collected, which

[2] 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)

[3] Conformity Assessment - General principles and requirements for validation and verification bodies, IS0/IEC IS 17029

information to be collected)	*What is the information that needs to be collected about traceable assets in order to verify the policy claim?*	controls undertaken, etc.). One example of a control could be to check that the weight of an output is the same or less than the sum of its registered inputs in order to ensure that no additional "non-conforming" inputs were used. iii) The standards and normative documents against which the claim is verified (ISO or industry standards/guidelines).
Identifiers (IDs)	*How do you know what happens to a traceable asset?*	To answer this question, you need to collect information that is linked to traceable asset and, to do that, the traceable asset must have a unique identifier (ID). Many IDs are attached directly to a product (traceable asset), such as a manufacturing batch number, an SGTIN (Serialized Global Trade Item Number), an EPC (Electronic Product Code) or a range of other options. Alternatively, when the traceable asset is a trade unit, then it is the trade unit that will receive a unique ID. This could be a package holding multiple items or a container holding a large volume of goods. *For example*, to identify goods that are being sold by the container load (such as dye or thread), the container (i.e. the trade unit) could be identified using a Standardized Shipping Container Code (SSCC).
Entry and exit points **When does traceability take place?**	When does traceability take place?	Entry and exit points are the events (activities) 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". Policy claims may not cover an entire value chain. The reasons for this can be technical, economic, or business-related. At the same time, if the entire value chain is not covered, the minimum requirement is to cover what is necessary to justify the policy claim. If this is not possible, then the policy claim needs to be modified. For example, if you cannot verify labour practices at the farm level, then a policy claim would need to say something like, "this product is manufactured (not produced which would include the farm!) using fair labour practices).

Verification process **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?	Verification is "confirmation of a claim, through the provision of objective evidence, that specified requirements have been fulfilled" [4]. In the context of traceability, the verification process is carried out by a verification (audit) agency that analyses traceability events and validates the information about them against the verification criteria and any other transparency system rules. A 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. The role of the verification agency is to: • 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) • Ensure that the data recorded for traceability purposes reflects what is actually happening in the supply chain (for example through field inspections) • Monitor and safeguard traceability by ensuring that assets meet entry/exit conditions and verification criteria (rules) are applied correctly.[5]

D. THE TRACEABILITY SYSTEM ARCHITECTURE - A MORE IN-DEPTH APPROACH

A description of fundamental components is referred to as an "Architecture" because it explains how a system is built. Architectures are useful tools when designing solutions because: If we understand all the components of a future traceability system, then the solution is to develop each of these components.

In addition, components can be designed in a stepwise process which is easier to plan and implement. The architecture ensures that components will assemble into a meaningful overall project. This is similar to building a house where the plan of the architect defines the different components (foundation, walls, roof, electricity system, etc.) and how these are assembled into a meaningful whole.[6]

This Traceability System Architecture describes in more detail the key components described in the previous section as well as a few additional concepts such as transformation rules. It draws a great

[4] ISO standard: ISO/IEC DIS 17029:2018(E), Section 3, "Terms and Definitions"

[5] 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)

[6] 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)

deal from the publication, "Traceability for Sustainable Trade, Framework to Design Traceability Systems for Cross Border Trade" (ECE/Trade/429)[7] and covers:

- **Policy Claims**
- **Traceable Assets**
- **Unique Identifiers (IDs)**
- **Traceability Methods**
- **Transformation Rules**
- **Entry and Exit Points**
- **Sustainability Information**
- **Verification Criteria**
- **Verification Process: The Role of Audit, Certification**

The sections after this one, provide more information about the ecosystem which is needed to support a good traceability system.

1. Policy Claims

As explained under Key Concepts, *"A policy claim is a high-level statement about a characteristic of an identified product (traceable asset) or a process associated with that product, where, in order to show that the characteristic is true, it is necessary to trace the asset as it moves through the value chain."*

Policy claims to support sustainable development objectives should be selected based on a value-chain risk analysis, corporate objectives, and a company's commitment to corporate social responsibility (CSR). It should contain the following elements:

- **A clear objective** connected to the purpose of tracing of the traceable asset **which** *sets out the sustainability requirement and summarizes the specific accomplishment(s) to be achieved by fulfilling the proposed Policy Claim.*
- **Description of the traceable asset** for the proposed claim**.** *The traceable asset is the physical product as a whole or its definite component, or its traded unit that is to be traced. For example, "organic cotton" is a definite component, whereas "made without slave labour" applies to the product as a whole and all its constituent parts.*
- **Description of the proposed claim.** *The claim should support the objective and should be defined in terms of the physical characteristics or process(s) connected to the traceable asset.*
- **The defined verification criteria** This can be a standard, a guideline or other document which describes the sustainability characteristics that a product or process must have in order to conform with the "claim". The criteria are what an auditor compares information against to determine if due diligence has been followed in ensuring a claim. Some organizations that develop sustainability standards and guidelines have rules about how they can be referenced in policy claims, so inquire with them before doing so.

[7] 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)

In addition, although it may not be included in the policy claim text, stakeholders should clearly identify the value chain segment(s), i.e. the operating activities or processes, connected to the traceable asset.

A suggested general format for policy claims is the following:

[Traceable Assets] comply with [Claimed State] in accordance with [Verification Criteria] for/to support [Objective]. Two examples of policy claims which follow this format are shown below with the following colour coding.

- Objective
- Traceable Asset
- Claimed state
- Verification criteria

#1 Example of Policy Claim

(From Brand Y) Imported knitwear contains ethically grown and traded cotton from Country A and is obtained in compliance with ILO fundamental labour standards for ensuring corporate social responsibility.

#2 Example of Policy Claim

(From Brand X) Imported Ready-made-garments from suppliers in Country B and was manufactured in accordance with the XYZ standard which supports sustainable procurement.

2. Traceable Assets

As described in the section on "Key traceability system concepts", a traceable asset is "any item [or traded unit] that needs to be tracked along a value chain."

2.1 Granularity of the traceable asset

When deciding which traceable assets to use, the **granularity of the traceable asset** needs to be decided upon.

Granularity determines the physical size of the traceable asset, including how aggregated it is. For example, options for the allocation of unique IDs include every individual product, shipping carton of products, production batch, container of goods, etc. In addition, for "production batch" can be defined at different levels of granularity. For example, a yarn manufacturer can typically choose whether they assign a traceable asset ID to a new production batch every day, every shift (e.g. 2-3 times per day) or to every bobbin, in a particular ring frame machine.

Granularity needs to be in line with the type of traceability method that is being implemented. The different types of traceability methods are described in the section on "Traceability methods", i.e. product segregation, mass balance, book and claim, etc. The most appropriate traceability methods will also depend upon

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

Higher granularity, while it provides greater accuracy, also means higher complexity (more IDs to be used and tracked) and higher costs, both internally and along the value chain (in transformation processes and shipments).

2.2 Maintenance of Referential Integrity

The effectiveness of a traceability system depends upon maintaining referential integrity. This means that a unique identifier (ID) needs to be assigned to each traceable asset and, to the maximum extent possible, this needs to be done in a way that prevents the ID from being lost or counterfeited.

Therefore, the choice of traceable asset should take into account the costs and possibilities for assigning and “attaching” unique IDs that meet these criteria.

A more detailed discussion on IDs can be found below in the section on “Unique Identifiers (IDs)”

2.3 Traceable Assets and Product Transformations

Within the textile and leather value chains, traceable assets are periodically used as inputs to processes that transform them into outputs which are new and different traceable assets. These outputs must also be traced, and linked to their inputs, so that when the customer receives a final product, all of the inputs can be identified – by following the links of the chain back to the beginning.

Transformation Stages for Natural Fiber and Leather Goods

- Fiber cultivation and harvest / livestock raising and slaughter
- Thread production / leather tanning
- Fabric manufacturing / leather finishing
- Clothing / footwear production
- Retailing
- Consumer use
- End of life

As a result of these processes, traceable assets need to be defined for each stage in the value chain and the relationship between traceable assets that are inputs and traceable assets that are outputs need to be clearly defined and recorded. This can become complicated because there is often not a one to one correspondence. For example, 1 batch of spooled thread might contain 3.5 bales of cotton - of which 0.3 bales came from a bale that was partially used in a previous batch. As a result, there are 3 bales allocated entirely to this batch, and then 0.3 and 0.2 bales (one left over from the previous batch and one that is not completely used in this batch) that will need to be shown as input to two batches.

More about transformations is discussed below.

3. Unique Identifiers (IDs)

Traceability requires information about the 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 that are related to an event must have a unique identifier: the product (asset), the party (company or individual), location, transport and process. Each event that affects the traceable asset should be registered and linked to the relevant ID(s).

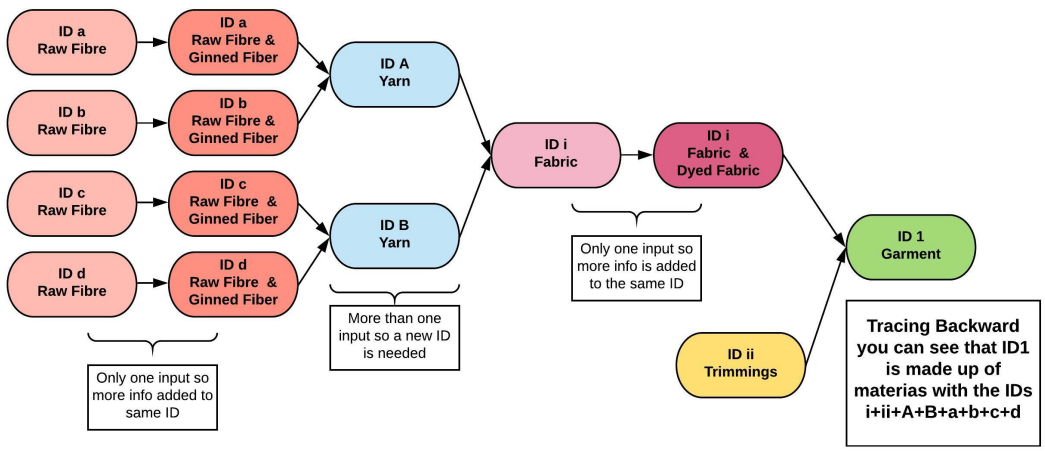
The uniqueness of IDs for traceable assets should be ensured by whomever assigns the ID which could be a party within a company (i.e. production batch IDs) or a trading partner in the value chain (i.e. trade unit numbers for packages or containers). It usually works best to assign IDs based upon a standard. For example, in the retail industry the most widely used unique ID is probably the Serialized Global Trade Item Number (SGTIN) standard of GSI[8].

- **Maintaining the integrity of IDs across product transformations**

The majority of traceable assets are transformed as they move through a value chain. For example, at the beginning of the value chain, the traceable asset may be a bale of cotton, then it is transformed into thread, then into cloth and, at the end, it may be a shipping carton full of cotton shirts. Each of these traceable assets (cotton bale, thread, fabric, shirt, etc.) must have a unique ID and if a traceable asset is the result of multiple inputs (for example more than one spool of thread being used to create a fabric), its one unique id will need to be linked to the unique ids of its multiple inputs.

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.

Figure 2.2



Maintaining accurate links between IDs across the value chain is called referential integrity. In

8 https://www.gs1.org/docs/technical_industries/Construction/GS1%20Guideline%20unique%20ID%20for%20products%20in%20Construction%20v1.1%20-%202018.pdf (accessed on 25-05-2020)

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 identifying the last two ranging from the United Nations Location Code (UN/LOCODE), for places, to the Global Legal Entity Identifier (LEI) for companies to EAN-UCC.

Verification checks, to ensure alignment with policy claims, can be done either at the end of any particular transformation activity or at the end of the entire process (by tracing back through the chain of input and output product IDs and associated information).

In addition, some "logic checks" or calculations regarding quantities may be made. For example, if you go back through the chain of links to the cotton bales that were used for the thread, the IDs for those cotton bales will tell you which farms they came from and the IDs for the farms will allow you to access information about if they were certified to grow organic cotton or not and their harvest capacity. Then an additional verification could be to check the amount of cotton a farm has sold in one year (based on the number of IDs registered) to see if it exceeds their maximum harvest capacity. If yes, then maybe they were selling non-organic cotton from other farmers as organic.

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 policy claim. There are a wide range of options including test or audit results, the IDs for inputs and their origins, the certification status of value-chain participants and/or the certification of specific locations, production lines or processes within a larger company), etc.

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 analogy, 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. Aggregation results in a "trade unit" which is the unit indicated on an invoice (for example if I buy 50 boxes of shirts then the trade unit is a box) and dis-aggregation results in either smaller trade units or individual items. There may also be some instances where it is important to also record unique logistic unit IDs for, in particular, shipping containers and trucks.

Trade Units are treated as a kind of traceable asset and are thus given unique IDs. The information associated with these IDs will include the input IDs (for the products in the trade unit "package") and a record of who has had possession of the trade unit within the value chain (the seller, the transporter, the purchaser, etc).

Information about possession of the goods (for example by transporters or warehouses) can be used for inventory management, for locating goods and for identifying who possessed goods and when if they were damaged or "contaminated" with goods from outside of the traceability network (i.e. with goods that may not conform with the product claim).

Successive links in the value chain between traceable assets that are products and trade units should be recorded. For this to happen a traceability system should:

- Ensure a secure integration between the physical product level (represented by the unique IDs for traceable assets) and the associated information level. This can be supported by continuous monitoring and recording of links between:

(i) different production batches,

(ii) production batches and trade units, and

(iii) different trade units,

throughout transformation, shipping and storage processes in order to ensure an accurate history of trade units and, thus, traceable assets.

- Predefine, in line with company objectives and the product claim, the information to be recorded during transformation, aggregation and dis-aggregation processes throughout the entire value chain.
- Ensure continuous monitoring and periodic validation of the data recorded at each process stage.
- Associate the flow of information with the physical flow of the products by registering departures and arrivals.

4. Traceability Methods

Depending on the characteristics of a product there are different traceability models. As

Insert image here

a. Product segregation (most demanding method)

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

There are two product segregation models: 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.

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

- **Identity Preservation (IP)** requires segregation of the certified material from the non-certified material and **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. Companies must know all their suppliers and collect and verify data at all levels throughout the supply chain.

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

Mass balance allows certified and non-certified products to be mixed, but in a controlled manner. Policy claims are validated and product segregation is maintained until the final

point of blending or mixing for a specific batch of a product. Mixing with non-certified product is controlled and recorded, so the proportion of certified content in the final product batch is known.

This type of mass-balance ensures the end-product contains a known proportion of certified product, which allows specific policy claims to be made. For example, "this product contains 33% certified content"

This is common for products and commodities where segregation is very difficult or impossible to achieve, such as for cocoa, cotton, sugar and tea.

c. Book and Claim (least demanding method)

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 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 commodities grown or processed according to the good practice in question – even if it is not certain that their product contains certified material.

The money from the sale of certificates is then used pay a premium over the market price to the producers whose goods were certified as using the good practice, thus providing an incentive for other growers to be certified.

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

Product segregation requires advanced Information and Communication Technology (ICT) implementations, in which the farmers and Micro-, Small- and Medium- Sized Enterprises (MSMEs) participate. It is used for high-risk and delicate products, such as fresh food, high-value products and products where regulations require that the specific origin of the product be known. Mass balance and the book-and-claim methods, on the other hand, require less advanced ICT systems. This is because they are based on a set of rules and require only periodic auditing by stakeholders. As a result, one factor that must be taken into account when selecting a traceability method is the ICT capabilities of participants in in value chains -– which vary greatly.

5. Entry and Exit Points

Entry and exit points are the events (activities) 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. The document ECE/TRADE/429 provides guidelines to take into consideration when deciding upon, reporting and monitoring traceability systems' entry and exit points.

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

- Keeping in mind the policy claim, it is important to clearly establish the authorized activity(ies) or locations where the traceable asset enters and exits the **traceability** system.
- Based on the verification required for a specific policy claim, the transformation and logistics processes that take place between the entry and exit points in the value chain should be visible. Visibility at each node (activity or location) consists of providing a minimum set of information including a location ID, a timestamp for entry and one for exit from the activity, the ID for the traceable asset coming out of a process and the ID(s) for its ancestors (the inputs). This is greatly facilitated when there are information systems for data interchange, and standards for determining the types and formats of the data elements to be recorded.

For example[9]*,*

A Policy Claim should be linked to a segment of the value chain where the traceability system records data for monitoring. The first step in developing the traceability solution is then identifying the entry and exit points in the value chain between which a traceable asset, with each intermediate "event" being an activity, for example, the landing of fish at a port. The Entry and Exit Points are the value chain activities which mark the start and the end of the value chain that the traceability system will trace. Good choices for Entry and Exit Points are locations where business processes are well controlled, i.e. where there is a high level of automation and business processes are well documented and enforced.

The traceable asset is assumed to have a specific and defined state at entry and exit points. An example of typical entry and exit points are landing zones in ports, Customs control points, inspection points, etc. Continuing with the shark fin example, an entry or exit point could be defined as follows:

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

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

6. Traceability Information and Data collection methodologies

Previous points have focussed on the information related to identifying traceable assets (unique IDs) and identifying the locations and events that the traceable asset passes through along the value chain. At the same time, in order to fulfil the focus of these Guidelines, information on sustainability needs to be collected. This information is determined by the policy claim and careful thought needs to be given to the points in the value chain where this information should be collected. Efforts should be made to minimize the amount of data collected and to identify existing sources for the data.

In addition, for business reasons, it may be useful to collect other information as part of a traceability system. Information related to product, quality and processes may be useful for business reasons and may also help to "pay for" the collection of sustainability data.

[9] ECE/TRADE/429

Table 2.3 Traceability information

Product related information	Quality related information	Process related information	Sustainability related information
• Origin • Composition • Material specifications • Product specifications • Economic-operator details • Batch number • Sales data • Cost	• Test procedures • Audit reports • Quality certification • Tracking data of surplus or damaged material/product	• Manufacturing process details • Time stamps • Unit identifications	• Environmental and social certifications • Carbon footprint data • Recycling data • Reparability and durability data

7. Verification Criteria

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 policy claims.

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 form part of the verification criteria.

Other verification criteria that may be useful include:

- Defining governance options and mandates for assigning 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 events (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.

Indicators (to be drafted)

8. Verification processes: the role of audit and certification

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[10] Fraud and errors can falsify records or render them incomplete; thus, the need to verify data, using comprehensive

[10] Olsen and Borit, 2013

verification methods, including audit, certification, chain of custody information, and physical markers[11] .

a. **Audit**:
To create confidence in a policy claim an audit process should take place in order to confirm that the predefined rules for the traceability process have been met, and prove that the traceable assets comply with the defined sustainability requirements and their performance indicators. The audit process should review and analyse the traceability data and events, and validate this information against the predefined entry and exit points along the value chain and the defined transformation rules and claimed state(s).

An audit agency performs audits to protect the integrity of the policy claim. The agency collaborates with relevant value chain partners and government agencies. It receives data on relevant events in the value chain transaction and evaluates the information against the defined conditions and rules. The audit agency could be from the public sector, connected to a ministry; it could be 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.

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.

b. **Certification**:
Certification of sustainability practices can be an important tool as part of a company's due diligence. At the same time, it is worth mentioning that it is a complementary and not a sufficient tool. Certification plays a similar role to that of independent audits (third party validation of sustainability claims), as its role is primarily for verification. Certification can provide trust and facilitate the collaboration process among value chain actors. However, since it imposes additional administrative and organizational costs, it is important, that certification for sustainability practices respects the following criteria:

- Is aligned with internationally recognised standards for sustainability and circularity of value chains in garment and footwear (e.g. ILO fundamental labour standards, OECD due diligence guidelines, etc.)
- Evaluates both environmental and social criteria on a scientific basis
- Follows a risk-based approach
- Verifies full chain of custody with an eye to avoiding fraudulent mixing of non-certified materials
- Is easy to use and understand
- Is affordable and scalable

[11] Kelly et al., 2011

- Makes training available to small value-chain actors on how to follow the standards and practices upon which the certification is based.

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

E. COST ALLOCATION AND INCENTIVE SYSTEMS

Estimating the implementation cost of a transparency and traceability framework and making decisions on cost allocation is a key element in its uptake and implementation. In this connection, putting in place an effective and efficient system of incentives and accountability mechanisms, both private and public, also play a key role.

Costs related to traceability and transparency exist in two forms: the first is the cost linked to the development of the system; the second is the cost for its ongoing implementation, including for data collection, entry into a supporting data exchange system, inventory management and labelling. Furthermore, it is important to highlight that development costs also include the use of a standardized dataset for information exchange among partners. The use of such standardized dataset is key to ensure that everyone is "speaking the same language" and that shared data is interpreted consistently and correctly. The decision about which information exchange standards to use should consider not just the costs on a short-term basis, but also the longer-term efficiency gains from having common data standards used by all actors across the whole value chain. The UN/CEFACT information exchange standard for the garment and footwear industry serves this purpose.

When deciding who should absorb such costs, and how to distribute them among partners along the value chain, the criteria could reflect:

- How the profit margins are distributed;
- The relative price of partners' outputs;
- Partners' product volumes;
- Partners' needs;
- The allocation of benefits from the traceability system.

When it comes to incentive systems, two main types of **incentives** can be identified: financial and non-financial.

Financial incentives, include economic and fiscal incentives, both positive and negative, that Governments can adopt to support value chain traceability and transparency. Among these incentives are financial support to technological innovation (See Box XX on Blockchain Pilot Projects); investments in physical and digital infrastructure; direct incentives for the development of interoperable solutions and digitalization; preferential financing loans and grants on the base of transparency and traceability criteria; funding of feasibility studies and pilot projects, in particular in value chains with a high concentration of SMEs.

Governments should consider supporting projects that create shared value for a good number of stakeholders and value chain actors, giving priority to SMEs and small suppliers in emerging countries.

On the other end, industry actors such as brands and retailers, could consider implementing private financial incentives schemes, such as premiums paid to suppliers of traceable fibres

and materials; premiums paid to suppliers with harmonized or interoperable systems; offers to cover part of the initial implementation cost for small suppliers.

Box 2.2: Blockchain pilot projects

Among the recent pilot projects supported by public funding it is worth mentioning the "**Blockchain for Made in Italy Traceability"** launched by the Italian Ministry of Economic Development and developed in collaboration with IBM to assess the applicability of blockchain technology in support of the traceability and promotion of Made in Italy policy claims and anticounterfeiting. The public support was financial and organizational, especially relevant in the consultation activities to guarantee an inclusive approach[12].

Chestny Znak is another good example of public support to a national transparency and traceability system. In this case the Russian government has been providing a roadmap, guidelines and setting up sector specific working groups including footwear, fur and garment industries and a track & trace system to guarantee the authenticity and declared quality of goods being purchased by customers against counterfeiting[13].

The UNECE **blockchain traceability pilot of organically-farmed Egyptian cotton** is implemented in partnership with industry actors[14] and aims to 1) Proof the possibility of increased connectivity and cost-efficiency based upon the use of blockchain technology and strengthened capacity to source more sustainably 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 all the production steps of the value chain along with relevant business data and sustainability data elements identified, and a selection of certificates linked to specific hotspots of the cotton value chain to ensure the traceability of a product type and assess the pilot's scalability to other textile fibers. The pilot will also test the use of DNA markers to keep the connection between the physical and digital assets traced with support of the blockchain technology.

Non-financial incentives are complementary to financial incentives and on the **government** side, they could include, measures to facilitate market access, fast-track processes and expedited custom clearance for products with higher transparency and traceability, specialized managerial and workforce training, development and nurturing of open source (See Box XX) technologies, traceability and transparency criteria for green and socially responsible public procurement, cradle to cradle criteria as part of an overall policy for waste management supported by government procurement (see Annex XX), and public visibility, both positive and negative. In addition, **industry actors** could encourage participation through user-friendly interface designs for the Apps used for data entry to make this as simple as possible and free training for SMEs in their value chains.

[12] Source: https://www.mise.gov.it/images/stories/documenti/IBM-MISE-2019-INGLESE.pdf
[13] Source: https://chestnyznak.ru/en/
[14] 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.

The underlying principle behind the use of incentives is to lighten the burden for actors such as SMEs, women-led firms and small actors in developing countries.

In terms of **accountability,** a shared accountability principle is suggested: every actor in the value chain should be held accountable for any lack of traceability and transparency within their "link" in the chain. The role of Governments is to adopt and enforce regulatory systems (i.e. norms and a clear taxonomy) that create a level playing field both within their country and at an international level. Intergovernmental Organizations and International Non-Governmental Organizations can help by supporting alignment efforts and schemes around a model regulation for traceability and transparency, both in developed countries where value chains are often "designed" and in developing countries where manufacturing and labour-intensive activities are predominant. Legislation should enable accountability, remediation mechanisms and identify mediation actors.

Box 2.3: Definition of Open Source

Open source means any open source, public source or freeware Intellectual Property, or any modification or derivative thereof, including any version of any software licensed pursuant to any GNU general public license or limited general public license or software that is licensed pursuant to a license that purports to require the distribution of or access to Source Code or purports to restrict the licensee's ability to charge for distribution of or to use software for commercial purposes or requires the inclusion of attribution notices in any redistributed software[15].
Three important principles of open data are: availability and access, re-use and redistribution, universal Participation[16].

F. SUPPORTING ROLE OF ADVANCED TECHNOLOGIES

This subsection addresses the supporting role that advanced technologies can play in traceability.

Global value chains pose great challenges for risk management particularly in the area of sustainability. To support this risk management, the ecosystem of actors involved are increasingly assessing the potential of advanced technologies such as distributed ledgers (blockchains), AI, machine learning, Internet of Things, and DNA marking – to name just a few.

It can play a big role in helping stakeholders to comply with transparency and traceability requirements and improve their operations by helping advance the entire industry through delivering and analyzing essential data on all crucial elements of the value chain. In addition, a catalogue of incentives should be developed and introduced in order to win the trust and interest of all stakeholders on the manufacturing end. This includes factory owners, their workers and immediate suppliers. The mission is to advance traceability by showing workers and producers how their labor conditions will be improved and how costs and materials can be saved in exchange for information. It is crucial to establish an open dialogue with these workers and ensure that it is supported by all involved parties throughout the entire value chain.

Technological innovation is key to tackling the challenges stemming from global value chains

[15] Source: https://www.lawinsider.com/dictionary/open-source.
[16] Source: https://odsas.org

when stakeholders look to foster sustainability and a circular economy. Advanced technologies can support improved value chain traceability and transparency by making standardized information about product origin and attributes essential data in a transparent and standardized way by assigning reliable digital identities to products, parts and components and then collecting and storing information about these identities. Therefore, it can play a key role in supporting stakeholders to comply with transparency and traceability requirements and improve their operations. The digital innovation creates higher connectivity between value chain partners and incentives for stakeholders to invest over the long term.

Most of these technologies are based upon the digital revolution and, therefore, pose the risk of deepening the gap between developed countries and developing/transitioning economies. In global trade, smaller actors who fail to keep up with the pace of digitalized processes could be undermined, resulting in substantial socio-economic impacts. Policy-makers and key industry actors have a key role to play in scaling up innovative solutions, as well as spurring coordinated action, collaborative approaches and partnerships in order to ensure the accessibility of technology at a global scale for all stakeholders.

From the outset, it is critical to consider several potential impediments to the use technology as a means to enable greater transparency and traceability in global value chains. First and foremost, cost and access are critical to ensure that the technology does not exclude smaller actors with limited resources.

Second, while technology may provide useful tools, it does not change the fact that data quality, and therefore system reliability, can be impacted by a number of non-technological factors. These include what information is captured, when and by whom as well as data-quality controls that are in place. Therefore, when designing traceability systems, regardless of the technology used, data accuracy and neutrality need to be a priority.

Lastly, engagement and participation are important prerequisites for enabling technology. To support these, it is essential to have awareness-raising on the potential of technology and capacity-building for using technology-based solutions Without these preparatory activities, technology cannot be effectively implemented. These preliminary considerations should create an enabling environment for an impactful use of technology.

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. It can turn challenges into new opportunities for a responsible industry, building confidence that facilitates trustworthy and efficient data collection and verification for an improved analysis. For that purpose, efficient and effective technology tools can be essential for supporting compliance with transparency and traceability requirements.

There are a number of technologies that can support efficient and reliable data collection and analysis. For instance, technology access is facilitated by open Innovation – and the development of “information infrastructure” to support such innovation, decentralized data and information sharing systems that advance common interests.

Table 2.3 List of advanced technologies with a supporting role for traceability systems

ADVANCED TECHNOLOGIES	SUPPORTING ROLE IN TRACEABILITY SYSTEMS
Artificial Intelligence and machine learning	Improved risk analysis thanks to enhanced controlling AI-powered systems – support the use of data from traceability systems in order to optimize value chains and operating processes

	as well as the tracking of textile waste.
Blockchain	Improved data reconciliation and tracing; real time data access; improved confidence that the data is immutable
Low-energy Internet of Things	Increased automation in data collection
Traceability devices (digital and physical tracers) -product DNA -RFID / NFC (mobile tracking systems) -QR code	Digital and physical markers on products and raw materials (microchips, RFID tags and product DNA) which help to track and trace a product's journey. They provide better quality and more accessible data In addition: A. higher accuracy in physical raw material tracing through multiple product transformations (i.e. from raw cotton to fabric) B. higher speed and automation C. lower cost in attaching data to products

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

CRITERIA/NEED FOR SELECTING TECHNOLOGY-BASED SOLUTIONS	**IMPACT**
Data collection, validation and publication systems that provide interoperability with a wide range of systems, platforms and technologies.	Adequate data access for all relevant stakeholders and allows the inclusion of the largest possible number of stakeholders at the least cost.
Data acquisition, transmission and exchange technology solutions built upon existing standards such as the UN/CEFACT standards	Facilitates interoperability and the exchange of data across systems.
The ability to use automatic rules in a system, and, very importantly, the ability 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.
Virtual and physical training is available to support the use of technology solutions	Encourage actors' engagement and good uptake
Low levels of complexity with lean and accessible processes	Cost-effectiveness for reduced time and effort to achieve organizational goals
Technology solutions to increase transparency and provide direct access on working conditions to factories, trade unions, NGOs	Better information about working conditions, lower audit costs
The ability to quickly and efficiently scale-up technology solutions and partnerships	Cost effective implementation in systems with large numbers of stakeholders
Support for SMEs	The ability to extend traceability further up the value chain and to include existing and new 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 existing technology does not perform as promised.

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

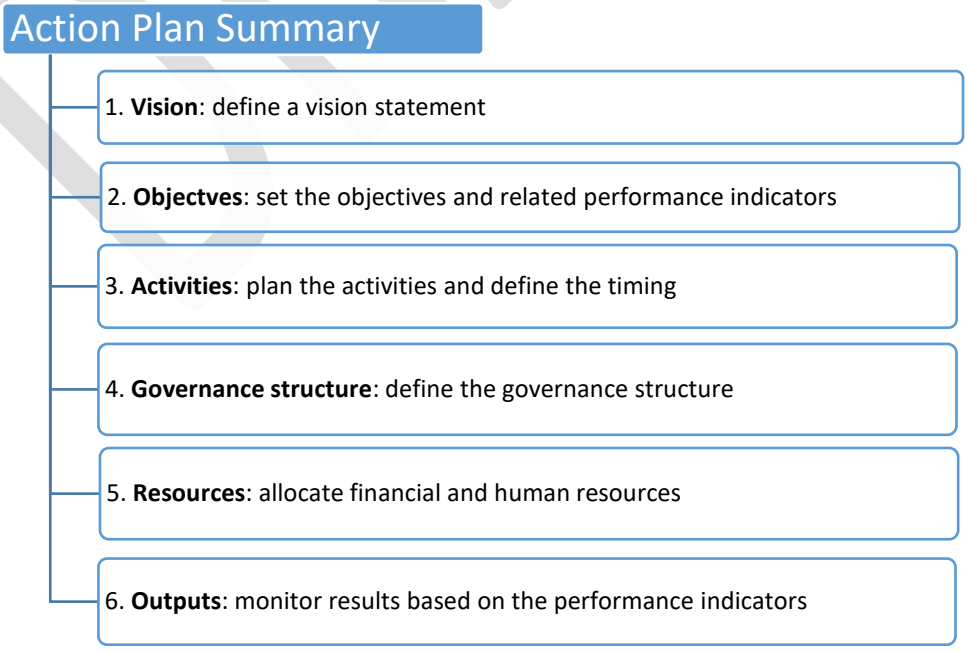
G. DATA ANALYSIS

This section will provide a structured framework for the analytical content and presentation of reports in order to support greater comparability between results.

Stakeholders committing to comply with transparency and traceability requirements will be invited to join the open innovation system, thus not only sharing, but also benefiting from data analysis and its impact on their own operations.

H. FORMULATION AND IMPLEMENTATION OF A TRACEABILITY AND TRANSPARENCY ACTION PLAN

In setting and implementing a traceability and transparency system, firms shall consider developing an Action Plan, whose purpose is to define a vision with specific goals, corresponding activities, and performance indicators. Such Action Plan should also determine the governance structure for putting in place the foreseen activities and for monitoring and communicating progress against the defined performance indicators and timeframe. Financial and human resources to be devoted to the implementation of the plan and the achievement of its objectives should also be clearly identified (see Figures 2.3 and 2.4)[17].



[17] Source : UNECE Guide to drafting a National Trade Facilitation Roadmap

1. Define a vision statement

The vision statement summarizes the objectives of a traceability and transparency system and the benefits for the stakeholders involved. The aim of the vision statement is twofold: it provides guidance and direction, and it serves as inspiration and a source of motivation. It should start from and be consistent with the overall corporate sustainability strategy, since traceability and transparency shall be considered as key enablers of a higher sustainability performance and capacity to manage the value chain more efficiently.

2. Set the objectives and related performance indicators

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 Action Plan should also set performance indicators to monitor and assess the achievement of the objectives or their results (Objectives Performance Indicators).

When formulating policy claim for products and their processes, the firm must clearly link them to traceability and transparency objectives defined in the Action Plan, verification criteria and data requirements, and related performance indicators. That is the condition for achieving the vision of increasing the sustainability performance through improved traceability and transparency.

3. Plan the activities and define the timing

The Action Plan needs to define how the set goals 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.
Implementing a traceability and transparency system shall be considered with a long-term view: planning the activities is needed at this point.

Typical decisions concerning activities to achieve a Traceability objective are about: the different types of information related to traceability that can be recorded; which specific information needs to be collected and shared and among who; how information will be shared with the actors of the supply chain; how frequently information will be shared; the technologies that will facilitate information sharing; how should information be stored (according to who needs to have access to the data and how often); the performance indicators to be monitored; when the content of the information should be reviewed; how to best communicate information to end consumers to inform their decision-making.

Typical decision concerning a Transparency are about the following key considerations: easy access, clarity and regular updates. The examples below by the Transparency Pledge[18] refer to effective disclosure when publishing supplier factory information but can be easily extended to activities to enhance transparency of the value chain:

- It is important to guarantee easy access of information by making information easily and freely accessible on the websites; and making information available in formats that have downloadable files and enable machine-readable searches.
- It is important to guarantee clarity in the disclosure by: clearly stating what precisely is being published and what definitions are being used; Clearly stating whether all authorized

[18] Source: : https://transparencypledge.org/good-practices-regarding-company-disclosures/

subcontractors used by cut-make-trim factories for processes to complete a brand's products are being published; Indicating the aggregate volume of business that is captured by the disclosure and the percentage of total supplier factories published; indicating exclusions from disclosures, if any, and impending plans to expand disclosures.

- It is important to guarantee regular updates by: specifying the date when the information was last updated and how frequently the information is publicly updated; communicating the achievements shall not be considered as a marginal activity since it is needed to justify the traceability policy claims, to educate consumers and inspire other industry players with the final goal of improving garment and footwear sustainability performance.

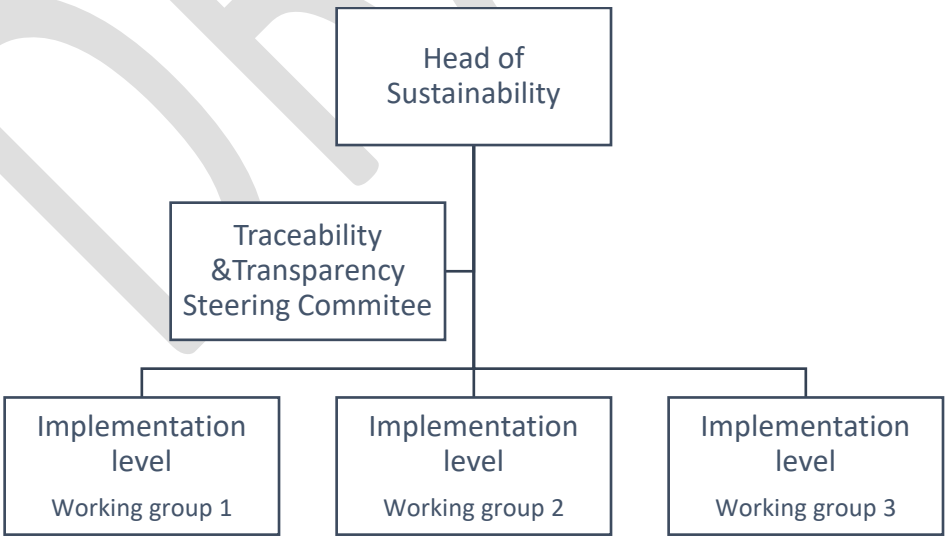
4. Define the governance structure

The Action Plan should include an outline of the governance structure required to manage and implement the activities. The detailed governance structure and the functions and composition of the Steering Committee will vary from firm to firm, in accordance with the organizational charts for sustainability related functions.

The ideal structure consists of a Steering Committee that is depending directly from the Head of Sustainability, and includes representatives from each department/function that is involved in the implementation, monitoring and communication of the identified activity and achieved results. The departments/functions that are involved in the implementation of each activity will be appointed, and the working groups to manage activities and projects will be formed.

Also in this phase it is important to include activities that focus on stakeholder communication and collaboration: this will ensure that all traceability stakeholders understand the common objectives and the scope of the activities of the Action Plan.

A sample governance structure is available in Figure 2.4.



5. Allocate resources

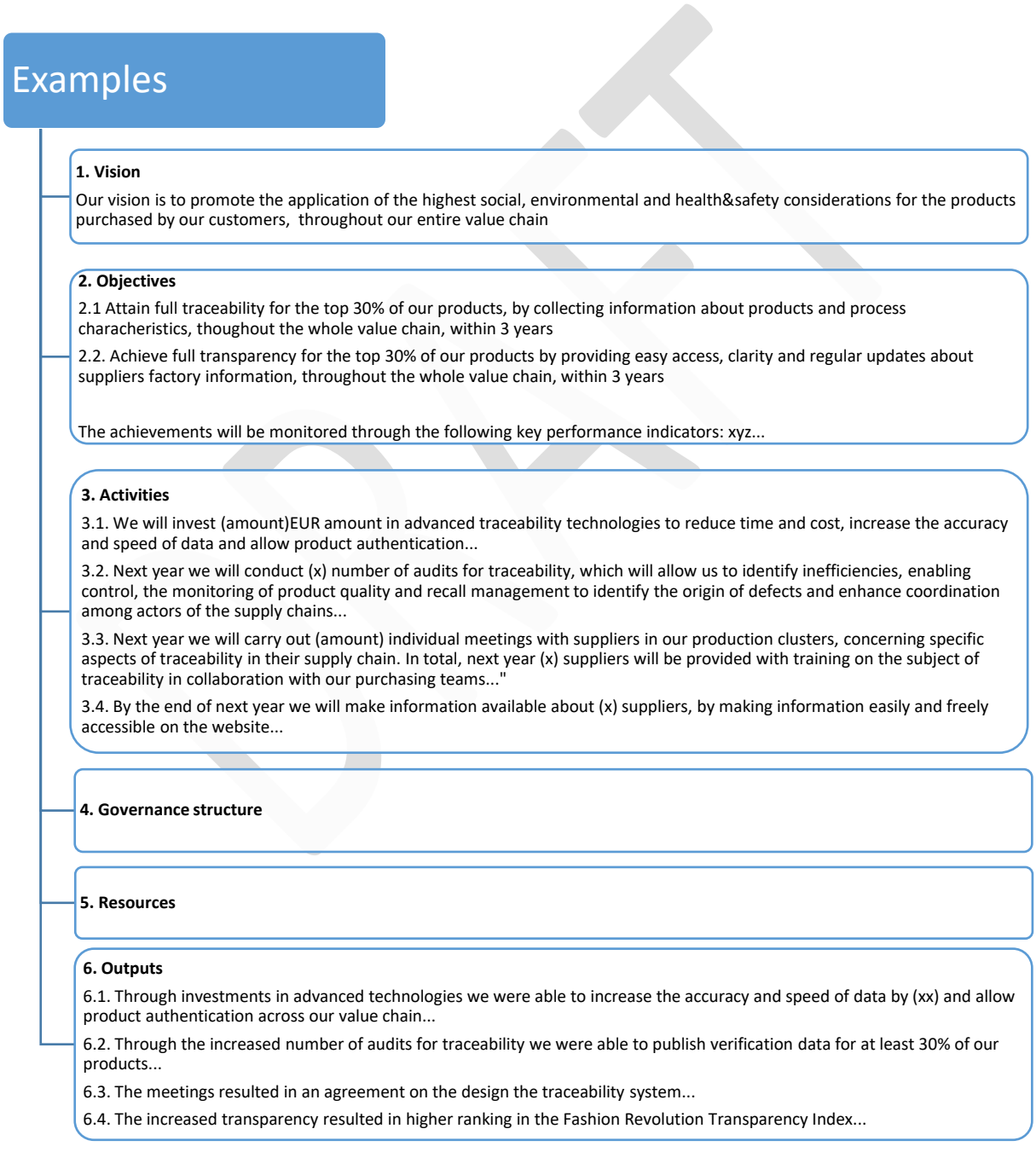
This section of the Action Plan should describe the necessary human and financial resources needed for the implementation of the activities, as well as the overhead budget for the management of the

Action Plan. Allocating human and financial resources ensures that the commitment to the Action activities is linked to a commitment to provide resources for the implementation of its activities, linked to a detailed budget.

6. Monitor results

Monitoring and evaluation are core elements of the Action Plan. A continuous monitoring of the results is needed in order to improve the sustainability performance in time and for firms to be considered eligible for Governmental incentives.

Figure 2.5

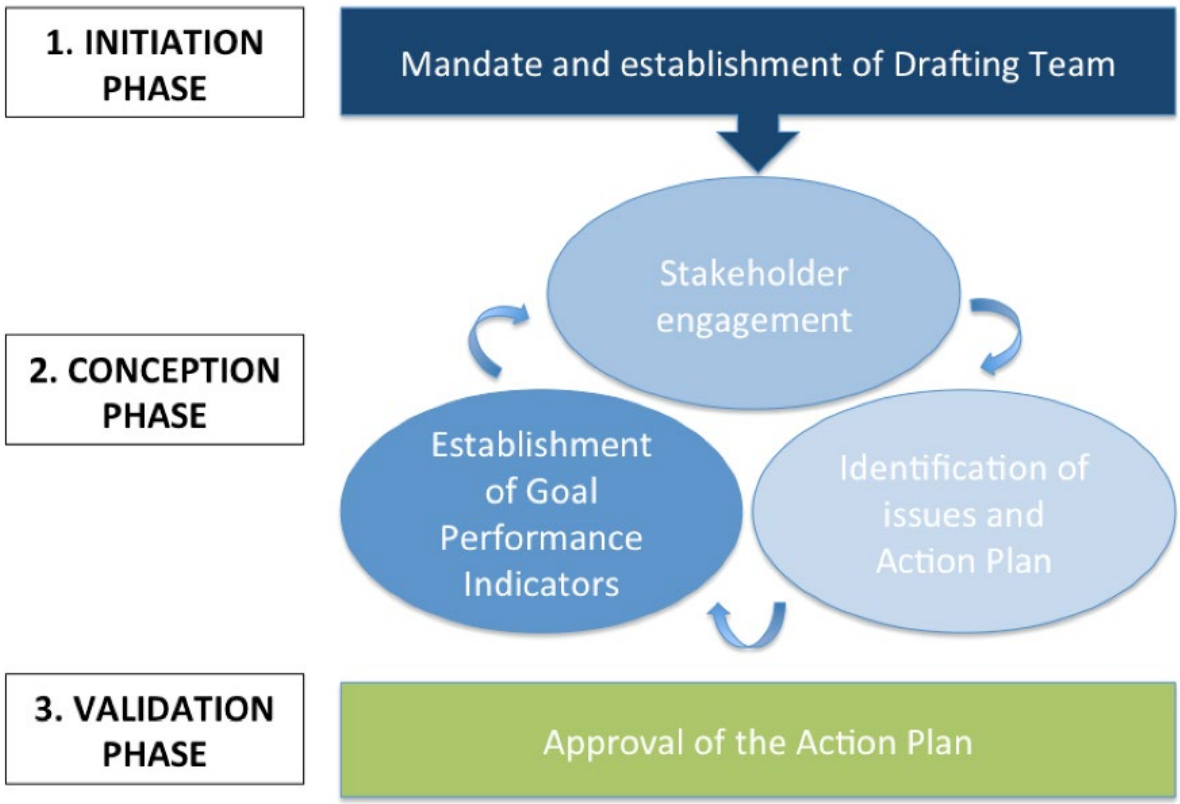


The **drafting process** for an Action Plan has three major phases (see figure xyz):

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

Conception Phase that consists of drafting the document itself. It includes three stages: 1) engaging stakeholders, 2) discussion with stakeholders on existing issues and possible activities to be undertaken as well as 3) defining the performance indicators to measure the achievements and results of the different activities. The outcome of the second phase is a consolidated draft Action Plan document.
Validation Phase, where the document is presented to the internal decision makers in order to receive formal endorsement to start the implementation of the activities included in the Action Plan.

Figure 2.6: Three-phase model for the drafting process of a Traceability Action Plan



"The three phases "Initiation", "Conception" and "Validation" are sequential, meaning they are only executed once and in this order. However, the three stages (engaging stakeholders, identifying issues and activities as well as establishing Performance Indicators) of the Conception Phase are iterative in nature. Thus, they might need to be repeated several times. Each step can unveil further issues in the processes or new proposals for how to address these issues. Consequently, it might be necessary to revisit previous findings, to redefine the activity or include new ones, to reconsider the Performance Indicators and to (re-) engage stakeholders."

1. Communicating the results and related recommendations

This section will contain guidelines on: incorporating reporting requirements into a policy framework; establishment of a repository of commitments and a reporting mechanism to monitor progress; and the sharing of good practices and lessons learned across relevant stakeholders.]

Communication supports learning and success. Communication methods can range from incorporating reporting requirements into a policy framework; to establishment of a repository of commitments and a reporting mechanism to monitor progress; to the sharing of good practices and lessons learned across relevant stakeholders.

I. CREATING INCLUSIVENESS IN TRACEABILITY SYSTEMS

In order to implement a resilient traceability framework and create shared value, policy-makers and industry actors must be inclusive. This means taking into consideration the integration of developing countries and small stakeholders as well ensuring gender equality. One important tool, among others, for supporting inclusiveness is capacity development which is discussed in more detail below.

Policy platforms could play a catalytic role in creating multi-stakeholder dialogue about inclusiveness and spur coordinated action. Moreover, multi-sectoral initiatives can also play a key role in supporting industry actors by building upon actions already taken to enhance transparency and traceability in other high-risk sectors such as agri-food, timber and minerals.

The proposed traceability framework is designed to facilitate its uptake by developing countries and smaller stakeholders and, when needed, to include support from industry associations and brands/retailers. As technology is instrumental to supporting traceability and transparency, one requirement is that the solution should be as simple as possible, easily accessible, cost-efficient and flexible in its implementation in order to ensure engagement and participation from actors with limited capacity.

Some actions that can be put in place in order to address these concerns include: making available low-cost devices and user-friendly[19] data collection tools to ensure that smaller actors (at farm and factory levels) in producing countries can provide the required information. In order to have efficient and effective tools, their design should take into consideration the language of users, communication channels and content which will build the confidence needed to support widespread use.

1. Integrating developing countries and small stakeholders

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 outsourced to developing countries and less-advanced countries. Aid-For-trade programmes help to improve the livelihoods of smallholders and smaller actors and better integrate them into global value chains so that they receive a higher proportion of shared value. When implementing traceability, developing and less-advanced countries concerns must be considered, and due support provided to suppliers and partners who lack the financial and human resources to collect and communicate the relevant data on their sustainability performance. Supporting their participation requires coordination and the assistance of downstream actors in order to alleviate the complexity and cost of reporting requirements for stakeholders involved in the upstream part of the value chain. Thus, in order to

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

assure the effective functioning of a traceability solution, one must ensure, before implementation, the feasibility of the traceability framework developed for the actors located in developing countries. Systems for improved transparency and traceability 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.

Since developing countries often focus on low-wage production, enhanced transparency and traceability are instruments which can support due diligence and the identification and mitigation of adverse impacts related to sustainability hot-spots (human rights, the environment and corruption risks). Smaller stakeholders may have little motivation to provide traceability and transparency information unless it is tied to a financial incentive (e.g. loan access, subsidies, higher prices for their outputs, etc.). Value-chain participants may also lack an understanding of sustainability which is why it is critical to showcase the added economic value of traceability, transparency and sustainability as a tool for facilitating global market access and fostering domestic economies to national authorities, customs and industry associations. For instance, being able to prove that a product meets the EU's rules of origin may enable the product to be exported tariff-free. Indeed, there is an increasing competitive advantage for producing and exporting countries if they can prove that they have taken action to support improved environmental sustainability and working conditions through the enforcement of labour and social internationally and acknowledged standards.

National government bodies, local community representatives and industry associations play a key role in supporting the implementation of traceability providing support for capacity development, for instance by covering the cost of training, capacity-building and awareness-raising activities and the development of open-source technology solutions. Governments must put in place an enabling environment for transparency and traceability which comprises not only the regulatory level, but also technical infrastructure and training for policy-makers, officials and smaller stakeholders (e.g. technology transfer, innovation, research, training and skills' enhancement).

Transparency and traceability are tools which facilitate the access of domestic industry to international markets by providing them with a competitive advantage. They highlight and prove the product's origin, content and quality to attract a higher and fair price. It also has the potential to support further market access, and adds value to products by ensuring compliance with international standards. However, the implementation of these international standards will very often require technical assistance and capacity building. The price that the industry in emerging economies receives for their goods needs to reflect this extra effort for traceability and transparency. Intergovernmental and international organizations, finance institutions and national development agencies have a key role to play into providing financial support to capacity development activities.

2. Gender considerations

As emphasized in the OECD Due Diligence Guidance for Responsible Business Conduct[20], gender-based issues are a key element when implementing due diligence. Due diligence activities must have tailored approaches for evaluating adverse impacts (human rights,

[20] OECD (2018), OECD Due Diligence Guidance for Responsible Business Conduct

environment, corruption) specific to women in an industry where employment is often precarious, informal or irregular.

In other words, the key questions for supporting gender equality with traceability systems are what kind of policy claims regarding gender should be made and how will these be validated and registered in the traceability system.

The clothing industry employs 60 to 75 million[21] people with direct jobs worldwide, of which two thirds are women. About 75 percent of global garment workers are women, which accounts for a very substantial share of the industry's workforce and of its economic growth, nonetheless only a very small share of women reach management and supervisory roles[22]. Economic practices, such as the search for flexibility, higher productivity and low prices, have resulted in the outsourcing of textile and apparel work to developing countries and the prevalence of women in the workforce (UNEP, 2020). This can be explained by the fact that women are paid less than men and lower wages ensuring industry profitability, with some national government bodies even promoting "cheap labour" and their "labour-cost advantage", thus further anchoring women's concentration in unskilled jobs (UNEP 2020). Promoting gender equality requires also identifying accumulated vulnerabilities (e.g. women who, in addition, are home-based workers, migrants, minorities) and considering women's specific positions at all stages of the production chain[23].

As outlined above, there are a number of concerns related to gender equality stemming from the particular features of the textile industry. It is essential to assess how impacts may differ for women and to support women's economic empowerment and their promotion into leadership positions along the value chains. Therefore, capacity development and training activities have a tremendous role to play in empowering women in the value chain, both at the downstream level (entrepreneurs and designers) and at the upstream level (female workers' upgrading toward higher-skilled jobs).

Samples of gender-related Policy Claims

Samples of gender-related Policy Claims
The apparel item (product/part/component) from *X suppliers* in *Y country* was manufactured in a factory which provides job opportunities for women in working conditions which comply with the standard Z.
The apparel item from *X suppliers* in *Y country* was manufactured in a factory which has women in leadership and management positions based upon policies which comply with the standard Z.
The apparel item (product/part/component) from *X suppliers* was manufactured in *Y* factory which endorses the standard *Z* promoting equal remuneration for women and men workers for work of equal value

[21] (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

[22] European Commission (2017) STAFF WORKING DOCUMENT - Sustainable garment value chains through EU development action

[23] OECD (2018), OECD Due Diligence Guidance for Responsible Supply Chains in the Garment and Footwear Sector, OECD Publishing, Paris

The imported apparel item (product/part/component) from *X suppliers* was manufactured in *Y* factory which endorses the standard *Z* complying with a due diligence exercise carried out on gender-based discrimination and violence in the workplace.

3. Support to Small and Medium-sized Enterprises

Traceability can be a costly activity which can put many enterprises on an unequal footing depending upon their size, available resources and human capacity. 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 the actors in the value chain, but to improve their sustainability footprint over the long-term in order to create a responsible and resilient industry.

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 setting up incentives and implementing a traceability framework. To support this approach, UNECE-UN/CEFACT have proposed the use of a twofold approach taken by UNECE-UN/CEFACT for traceability taking into account the 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, specialized managerial and workforce training, infrastructure investment, fast-tracked processes and public visibility. Specific support should be given to SMEs on technical and organizational aspects.

In order to contribute to the common goal of enhancing transparency and traceability for sustainable value chains in garment and footwear, UNECE through UN/CEFACT supports the continuation of the multi-stakeholder policy dialogue platform initiated at the outset of the project. This will support a continuous consideration of implementation, technological and capacity-development-related concerns in the implementation of the traceability framework through active engagement with the industry, the academia and NGOs. The resulting multi-stakeholder policy dialogues will be an opportunity to share good practices, recommendations and experiences with regard in implementing the UNECE-UN/CEFACT traceability framework, particularly for small businesses that are not supported by certifications or third-party verification.

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 on field visits to have a clear view of what data is collected and by whom. Longer-term and stable contracts also ensure confidence by helping to re-assure participants with regard to the purpose of the data collected.

Other civil society organizations such as non-governmental organizations and trade unions which are in the field 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 transparency and traceability to the local community in terms of social (labour conditions) and economic aspects (marketing and competitive assets).

J. GOVERNMENT POLICY OPTIONS

1. Due diligence reporting requirements

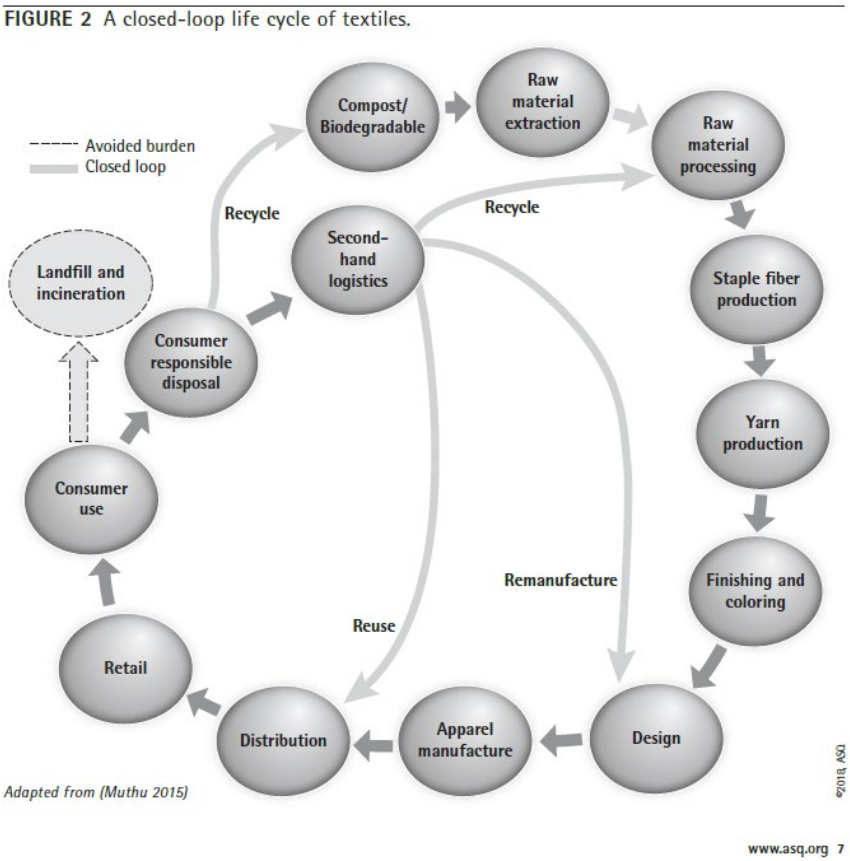
(drafting in progress)

K. ANNEXES

1. GLOSSARY

(Drafting in progress)

- **Circular Economy,** products maintain their potential to create value for as long as possible. Products have a long lifetime, due to a durable design. In case a product breaks, it is repaired. When a consumer no longer needs a product, it is passed on and reused by another consumer, or products are shared from the outset. Products that are discarded after their first technical or economical lifecycle are updated or refurbished and begin another life cycle, or if this is not possible their materials are recycled with a minimum of remaining resources ending up in energy recovery.
  European Commission (2019)[24]
  Circularity in textile and footwear value chains:



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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 2017

[24] European Commission, *SWD 2019 Sustainable Products in a Circular Economy - Towards an EU Product Policy Framework contributing to the Circular Economy*
[25] *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

- **Entry and exit points** are the supply chain activities which mark the start and the end of the supply chain that the traceability system will trace.
  ECE/TRADE/429 (2016) Traceability for Sustainable Trade[26]

- **Policy/Product claim** is a high-level statement, usually about an intangible feature or a process that is associated with a traceable asset that requires tracing of a supply chain and is supported by data collection. For example, the claim that a product is "organic" or "sustainably produced".
  ECE/TRADE/429 (2016) Traceability for Sustainable Trade[27]
  - Objective
  - Traceable Asset
  - Claimed state
  - Verification criteria

- **Sustainability**, in this context, is understood as the manufacturing, marketing and use of garment, footwear and accessories, and its parts and components, taking into account the environmental, health, human rights and socio-economic impacts, and their continuous improvement through all stages of the product's life cycle
  UNECE 2018

- **Traceable asset** is the physical product as a whole or its definite component, or its traded unit that is to be traced/tracked. Within garment and footwear it is, "any item (for example an object, a product or other traded item or a service) that needs to be tracked along a supply chain." (UNECE Traceability for Sustainable Trade Guide[28]). It can also be thought of as the unit that one wants to trace or record information about in a traceability system. In a garment or footwear value chain, it can refer to any manufacturing batch or logistic (packaging) unit of raw materials, intermediary or finished products. In order to track a traceable asset, it needs to be given an identifier. This is most commonly a numeric or alphanumeric code which, either on its own or together with other relevant codes (for example for locations) allows tracking of the traceable asset at any point of time and/or back to its origin.

- **Traceability** is understood as "the ability to trace the history, application or location of an object" in a supply chain (*ISO, 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" (*UN Global Compact 2014*); and "the process by which enterprises track materials and products and the conditions in which they were produced through the supply chain" *OECD, 2017*

- **Traceability Architecture** is a description of fundamental components, and is referred to as an "Architecture" because it explains how a system is built. Architectures are useful tools when designing solutions because: If we understand all the components of a future traceability system, then the solution is to develop each of these components. Each component can be designed in a stepwise

[26] UNECE, Traceability for Sustainable Trade, A Framework to Design Traceability Systems for Cross Border Trade, ECE/Trade/429, accessible at http://www.unece.org/fileadmin/DAM/trade/Publications/ECE_TRADE_429E_TraceabilityForSustainableTrade.pdf (accessed 17-05-2020)
[27] idem
[28] idem

process which is easier to plan and implement. The architecture ensures that components will assemble into a meaningful overall project. This is similar to building a house where the plan of the architect that defines the different components is assembled into a meaningful whole:

- **Traceability Framework** which is the entire ecosystem supporting value-chain traceability including policies, systems, support, and promotion. It covers the use of traceability across the entire value chain - from the extraction and processing of raw materials, to finished product branding and retailing, consumption and post-consumption activities. In addition, the Guidelines propose a step-by-step approach, a roadmap, for the development and implementation of a traceability framework both at the industry and government level.

- **Traceability Rules** describe how the business processes between an Entry Point and an Exit Point need to be organized so that the Policy Claim is met."
  ECE/TRADE/429 (2016) Traceability for Sustainable Trade[29]

- **Traceability System** in this document refers to all of the practical processes, procedures and technology needed to create a functional traceability system. It does not refer to the surrounding ecosystem with its policies, incentives, promotion, etc. A traceability system together with its surrounding ecosystem forms a traceability framework.

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

- **Sustainability criteria** can be a standard, a guideline or other document which describes the characteristics that a product or process must have in order to conform with the "claim". The criteria are what an auditor compares information against to determine if due diligence has been followed in ensuring a claim.

[29] idem