Virtual conference meeting #3 – Textile and Leather Traceability Standard

Explanatory Note for the Business Process Analysis Activity and the Generic Traceability Model

Version of 30-03-2020

Business Process Activity – A summary

It is important to note that the Business Process Analysis is a first step in the development of data standards for traceability and transparency in Textile and Leather Value Chains. It is intended to cover the vast majority of use cases to ensure uptake and use of the standard. As a result, it is a documentation of what data is needed, **it is not where decisions are made about the data standards and it is not a documentation of best practices.**

The business process analysis identifies as step 1, all of the existing value-chain partner roles, the existing processes and activities inside the value chain, all of the existing exchanges of data and the content of those data exchanges. As step 2, it attempts to identify what data is needed to establish transparency and traceability and where and when that data should be collected in the supply chain.

The results from the business process analyses will be:

1) An input to the much more technical data analysis and data standards development process, this is where specific data element standards and code lists will be decided upon and

2) An input to the development of implementation guidelines. This input will help the drafters of the guidelines to identify possible changes that could be recommended in order to allow and improve the collection of traceability data within value chains. It is during the development of the guidelines, where the business process analysis is only one input that best practice recommendations will be identified and included.

More information about the business process analyses to be carried out starts on page 5.

Purpose of the generic traceability use case diagram

To be read after reviewing the **Generic Traceability Use Case** found in annex 1.

The purpose of this diagram is to illustrate the principle processes for establishing traceability and how they can be applicable across different products – i.e. the model should be good for cotton, wool, viscose, leather, etc.

This is supposed to be a very high-level diagram. After we have agreed on the principle processes, we will develop much more detailed information for each process.

> One important question that needs to be answered with regard to the **Use Case**, is the degree to which we want to add in complexity.

Supply-chain partners

As currently drawn, there are six kinds of supply chain partner roles (some of which may be fulfilled by the same organization):

1) **Requestor of Traceability -** requests that a traceability process be implemented. This could be any down-stream supply chain partner that wants to make a "policy claim" to its clients. Therefore, it could be the spinner, the weaver, the manufacturer or a brand/retailor.

2) **Transformation partners**[1] - process or change the product in some way when they possess the goods (i.e. ginner, spinner, weaver, dyer, garment manufacturer, etc.). It is the responsibility of the transformation partner to ensure that their output products have IDs and to link each ID to specific information. An output product may be a shipment, a batch or an individual product. What constitutes an output product and which information the transformation partner is required to associate with an output product's ID will depend upon the requirements of the "Requestor of Traceability".

   Examples of information that can be associated with an output product ID are: the ID of the transformation partner; a production date; a bill of lading; an ID for the location of processing (which may to down to the level of production line); an Initial type testing result and the IDs of product inputs.

   The ID of the transformation partner and/or the production location will, in turn, have information associated with them. Examples of such information are certifications, inspections, audits, organizations implementing these and the dates they were performed. Which information needs to be kept is, again, decided by the Traceability requestor.

   One transformation partner will also have a special role as the "Entry point" where traceability begins and the first information about the product is registered.

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[1] This includes outsourced activities of a transformational nature. The fact of being outsourced is related to payments and contracts – not to the nature of the activity. An outsourced activity can be almost any activity along the supply chain. For example, it can include large transformations such as dying or sewing or smaller ones like washing or ironing.

3) **Providers of ID (and or ID labels)** supply identification. In order for a product or component to be traced it must be identified and have some form of identification and each party in the supply chain also needs to have an ID. This supply-chain partner's role is to provide the identification. It can be carried out by a transformation partner, but it could also be done by a Certifier or an Inspection organization or an association that specializes in identifiers (such as GS1) or a government (if, for example, a company is identified by its tax ID).

4) **Product-guardians** - make no changes to product or raw material, they only store or transport it. Their possession of the product is recorded in order to establish "chain of custody" since product "contamination" or "substitution" could take place during their custody.

5) **Auditors, and other Validators** - validate claims made about products or entities / organizations. In addition to auditors, these supply-chain partners could include certifiers, inspectors, brand auditors or self-auditors. Who is allowed to have this role is determined by the Traceability Requestor. This role provides the data that allows traceability to work by ensuring that processes along the supply chain are implemented in a way that supports the policy claim in question. They are not producing , transforming or undertaking logistic activities, but are key to ensuring the proper working of supply chain integrity (identifying, auditing, etc).

6) **Customers -** are usually the customers of the "Traceability Requestor" so they could be the weaver who is buying "organic cotton thread" or the manufacturer who is buying "organic cotton fabric" – in addition to, or instead of, the final customer who purchases the garment.

Chain of custody information

As a product/component moves through this process from farm to store, it collects information which includes the IDs of components (for example if it is fabric, the IDs of all the spools of thread used to weave the fabric) and the IDs of all the parties who had custody.

As currently diagrammed, the control as to whether products have been transformed acceptable practices and/or acceptable materials can take place either at the time of any transfer or at the end of the entire process. What is "acceptable" is decided by the Traceability Requestor as are the proofs that can be used to show this. The actual verification is done by checking all of the component IDs and the IDs of all supply-chain participants "attached" to the product as well as the information associated with those IDs.

The information linked to these IDs depends upon what the Traceability Requestor has asked for and can be test or audit results, the IDs for inputs and their origins, the certification status of supply-chain participants, (remembering that a "transformation partner" may be a specific location, production line or process with a larger company), etc.

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Additional layers of complexity

Additional layers of complexity that could be added, but which are not there now are listed below. Some of these may need to be added when the work moves from identifying the processes that exist today to how they could be modified in order to ensure different levels of transparency and traceability. Associated questions are inserted in parentheses:

1. To include **event recording** (UNCEFACT TT Level 0, or EPCIS structures) which includes recording all events associated with a product instance or batch, so this may require multiple entries while the goods are in the possession of one supply chain partner. For example, fabric may be cut, assembled into suits, buttons and zippers added, the suit ironed and then packaged within one facility. This would require at least 5 entries if all events are recorded.

2. **Physical control** (how?) of the goods at one or more points (where?) in the supply chain to be sure that the all partners in the chain of custody have maintained their "good" behaviour. This could be done (when?) for every product, every batch of products (what is the definition of a "batch"?) or only as a periodic control (based on what risk analysis undertaken by whom?)

3. **Volume reconciliation** for **mass-balance traceability system** (how and when and for all or which processes?)

4. **Book and claim system**. Used for cases where the asset itself has no identifying-specifying characteristics. For example . the amount of electricity used from renewable sources (the power is always 220 V 50 Hz whether its source is hydro , wind solar or carbon. idem for the water sourcing.

5. Answers to questions about what information is needed, and where it can be collected, in order to support integration of textiles and leather into the **circular economy**

6. A traceability chain that traces **product type – product class characteristics and/or individual product characteristics**. With this level we can meet information requirements for the reuse / recycling and the end-of-life time of the product and the circular economy. On the other hand, this is much more expensive and technically difficult to implement.

The more detailed analysis of the Generic Traceability model can only begin after the Use Case diagram is agreed upon.

Business Process Activity – In more detail

Detailed analysis process: 5 steps

The process analysis we are undertaking consists of 5 steps, each of which builds upon the previous step. A brief overview can be found below:

1. Prepare a **Use Case diagram** identifying the principle processes for transparency and traceability. See Annex 1

2. For each process, develop an **Activity Diagram** showing the participants in the process, the actions/activities undertaken, the sequence of actions and any information flows

3. For each Activity Diagram prepare a **Business Process Description** which describes in text, "the story" behind the diagram as well as any information exchanges, including documents. These descriptions will also identify: types of legal requirements impacting the process; the sustainability risks for each process; methods (such as certifications) that could be used to

address these risks; and the nature of each activity according to EPCIS event categories (transformation, aggregation, transaction, object). A more detailed description of the EPCIS categories is in annex 5. This information is needed by those doing the technical data modelling and also helps to identify at which points in the process new IDs need to be generated. When preparing a business process description, examples of documents and information exchanges should be collected.

4. **List of Document/Information Exchanges** – This is based on information in the Business Process Descriptions and lists all of the information (including documents) exchanged for the Use Case and identifies where the same information is exchanged in different business processes (activity diagrams)

5. For each of the Information Exchanges listed in 4, prepare **a List of the Data Elements** (for example, date of delivery or product quantity) included in that information exchange. These are based on the list from step 4 and the examples of documents and information exchanges collected in step 3.

In parallel to the "Generic Traceability" process analysis, we will need to undertake a detailed analysis of the Cotton to Finished Garment Process as it exists now to inform the work for the first pilot under the project.

Then, we will "overlay" the Generic Traceability process on top of the existing process in order to determine where additional activities or data collection need to be added into existing processes.

In summary, we will undertake 2 ½ process analyses (as described in the 5 steps above)

1) One that is Generic for Traceability (see annex 1 for Step 1)

- To identify what data needs to be exchanged, with whom and when in order to establish traceability for **a policy claim** by the brand / producer / factory

- To identify what data needs to be exchanged, with whom and when in order to establish traceability for transparency about a **product's characteristics** (technical, environmental and social)

2) One for the Cotton to Finished Garment Process as it exists now (see annexes 2, 3 , 4 and 5 for examples)

- To identify what product and process data is currently exchanged, with whom and when

2,5) A Revised Cotton to Finished Garment Process that includes the actions and data needed for Traceability

- To identify if any new product or process data will be needed to implement the generic traceability process

- To identify when and from whom data should be collected in order to implement the generic traceability process – with a secondary objective of trying to minimize additional data collection and exchanges (i.e. costs)
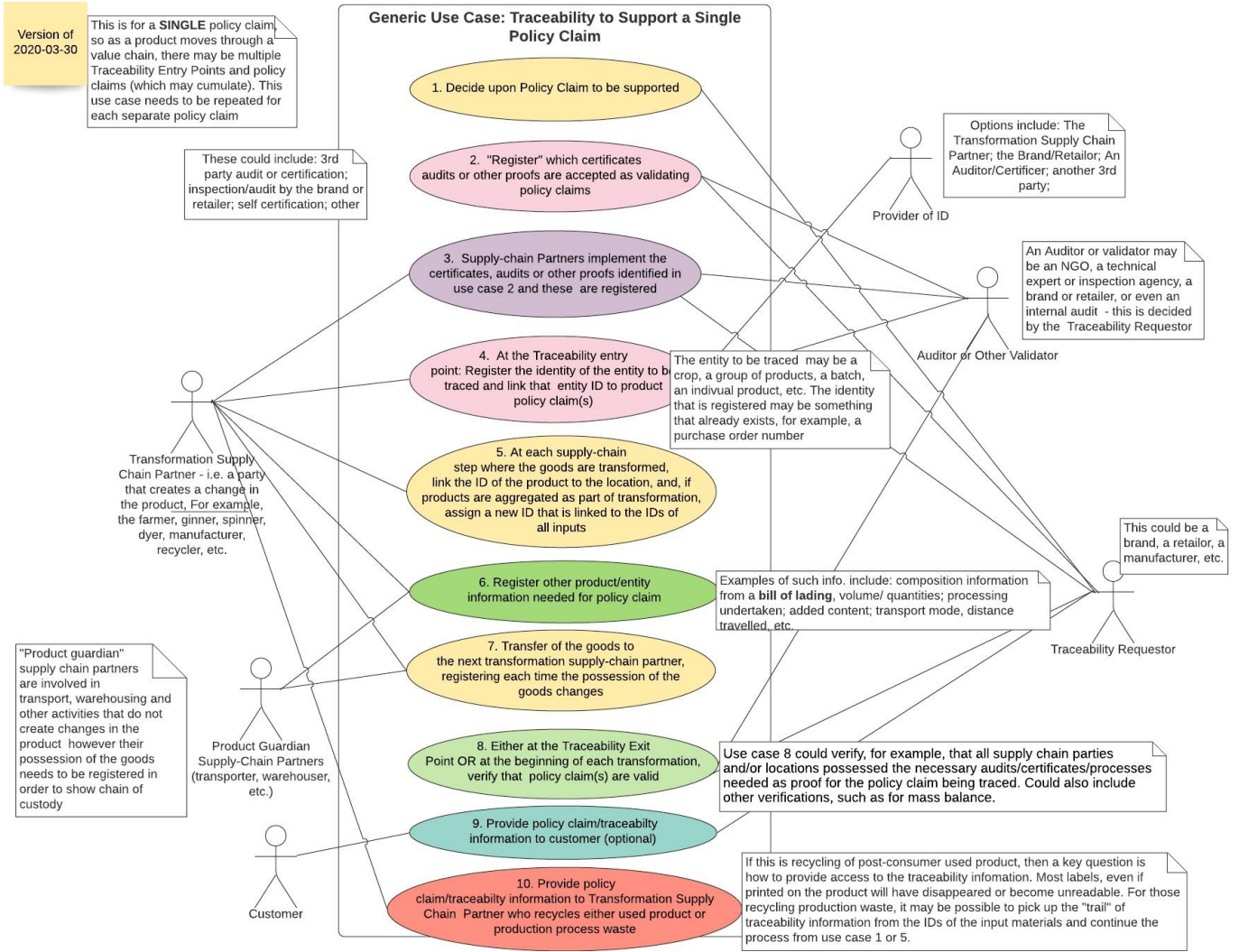
The outputs from the above will be passed to the technical standards team who will use them to identify the specific data elements and codes to be recommended.

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ANNEX 1 – Generic Use Case – Traceability

Version of 2020-03-30

This is for a **SINGLE** policy claim, so as a product moves through a value chain, there may be multiple Traceability Entry Points and policy claims (which may cumulate). This use case needs to be repeated for each separate policy claim

Generic Use Case: Traceability to Support a Single Policy Claim

1. Decide upon Policy Claim to be supported

These could include: 3rd party audit or certification; inspection/audit by the brand or retailer; self certification; other

2. "Register" which certificates audits or other proofs are accepted as validating policy claims

Options include: The Transformation Supply Chain Partner; the Brand/Retailor; An Auditor/Certificer; another 3rd party;

Provider of ID

3. Supply-chain Partners implement the certificates, audits or other proofs identified in use case 2 and these are registered

An Auditor or validator may be an NGO, a technical expert or inspection agency, a brand or retailer, or even an internal audit - this is decided by the Traceability Requestor

4. At the Traceability entry point: Register the identity of the entity to be traced and link that entity ID to product policy claim(s)

Auditor or Other Validator

The entity to be traced may be a crop, a group of products, a batch, an indivual product, etc. The identity that is registered may be something that already exists, for example, a purchase order number

Transformation Supply Chain Partner - i.e. a party that creates a change in the product, For example, the farmer, ginner, spinner, dyer, manufacturer, recycler, etc.

5. At each supply-chain step where the goods are transformed, link the ID of the product to the location, and, if products are aggregated as part of transformation, assign a new ID that is linked to the IDs of all inputs

This could be a brand, a retailor, a manufacturer, etc.

6. Register other product/entity information needed for policy claim

Examples of such info. include: composition information from a **bill of lading**, volume/ quantities; processing undertaken; added content; transport mode, distance travelled, etc.

Traceability Requestor

7. Transfer of the goods to the next transformation supply-chain partner, registering each time the possession of the goods changes

"Product guardian" supply chain partners are involved in transport, warehousing and other activities that do not create changes in the product however their possession of the goods needs to be registered in order to show chain of custody

8. Either at the Traceability Exit Point OR at the beginning of each transformation, verify that policy claim(s) are valid

Product Guardian Supply-Chain Partners (transporter, warehouser, etc.)

Use case 8 could verify, for example, that all supply chain parties and/or locations possessed the necessary audits/certificates/processes needed as proof for the policy claim being traced. Could also include other verifications, such as for mass balance.

9. Provide policy claim/traceabilty information to customer (optional)

10. Provide policy claim/traceabilty information to Transformation Supply Chain Partner who recycles either used product or production process waste

If this is recycling of post-consumer used product, then a key question is how to provide access to the traceability infomation. Most labels, even if printed on the product will have disappeared or become unreadable. For those recycling production waste, it may be possible to pick up the "trail" of traceability information from the IDs of the input materials and continue the process from use case 1 or 5.
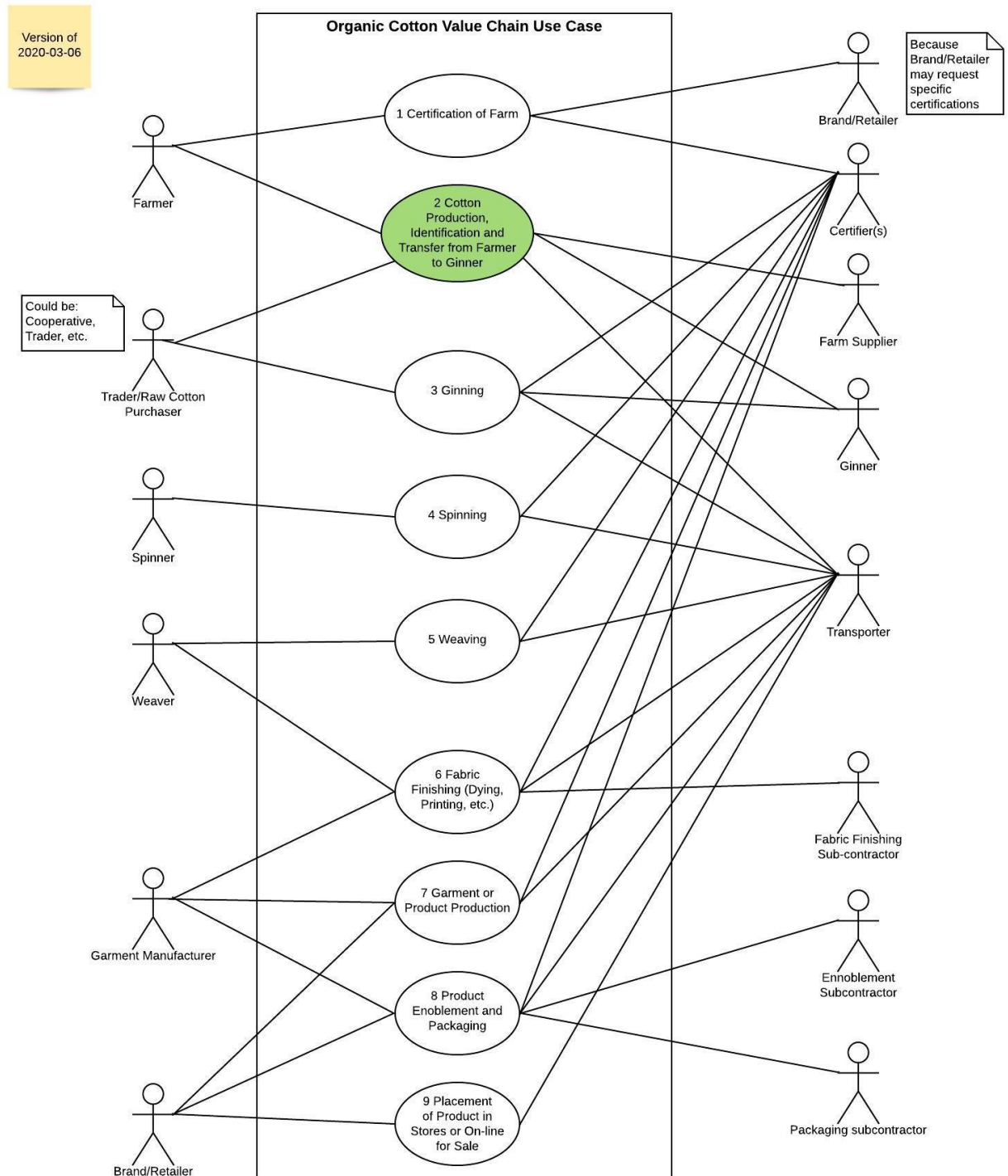
Customer

ANNEX 2 – Generic Use Case – Cotton – Note if there are more than 10 processes to be documented, then we should divide this into 2 or more Generic Use Cases
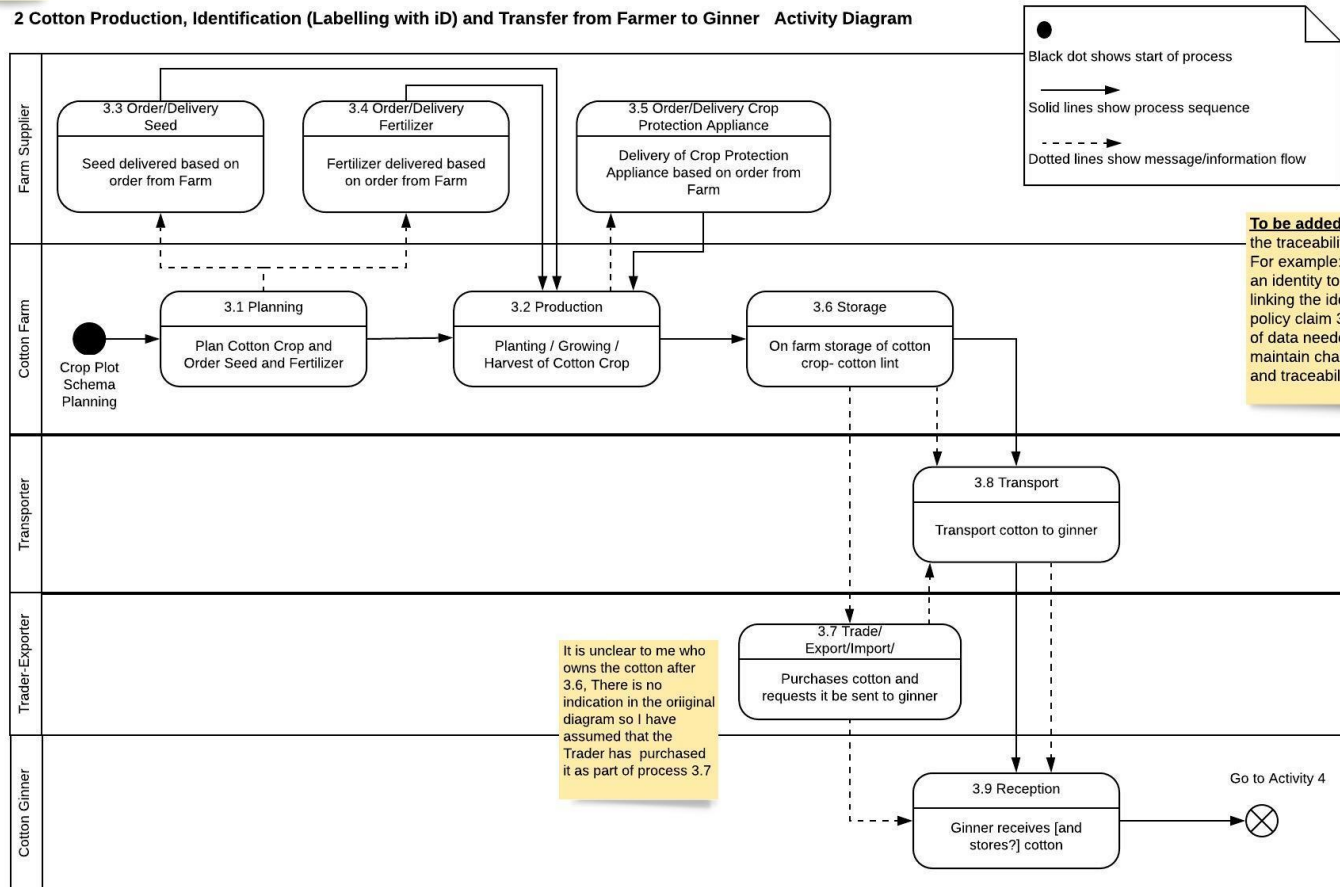
ANNEX 3 Activity Diagram Example – from Process 3 from Cotton Use Case

2 Cotton Production, Identification (Labelling with iD) and Transfer from Farmer to Ginner   Activity Diagram

● Black dot shows start of process

→ Solid lines show process sequence

⇢ Dotted lines show message/information flow

Farm Supplier

3.3 Order/Delivery Seed

Seed delivered based on order from Farm

3.4 Order/Delivery Fertilizer

Fertilizer delivered based on order from Farm

3.5 Order/Delivery Crop Protection Appliance

Delivery of Crop Protection Appliance based on order from Farm

To be added in Step 2: the traceability processes For example: 1) assigning an identity to the cotton 2) linking the identity to the policy claim 3) registration of data needed in order to maintain chain of custody and traceability.

Cotton Farm

Crop Plot Schema Planning

3.1 Planning

Plan Cotton Crop and Order Seed and Fertilizer

3.2 Production

Planting / Growing / Harvest of Cotton Crop

3.6 Storage

On farm storage of cotton crop- cotton lint

Transporter

3.8 Transport

Transport cotton to ginner

Trader-Exporter

It is unclear to me who owns the cotton after 3.6, There is no indication in the oriiginal diagram so I have assumed that the Trader has purchased it as part of process 3.7

3.7 Trade/ Export/Import/

Purchases cotton and requests it be sent to ginner

Cotton Ginner

3.9 Reception

Ginner receives [and stores?] cotton

Go to Activity 4 ⊗

ANNEX 4 Business Process Description Example

Name of process area	Cotton Traceability – The information in this form was "invented" as an example, it needs to be filled in by a cotton supply chain expert			
Name of business process activity (use case)	3. Cotton Production and Transfer from Farmer to Ginner			
Related laws, rules, regulations	Laws regarding child labour and pesticide use			
Sustainability Risks, Criteria and Validation If the list is too long this section could be moved to an "annex".	**Sustainability risks (hot spots) within this process**	**Sustainability criteria and standards to address the risk**		**Validation methods for criteria and standards**
	Use of dangerous pesticides	For example, no use of banned pesticides (a criteria)		Certification, Audit, Inspection, Self-evaluation, etc.
Process participants	Farm supplier, Cotton Farm, Transporter, Trader, Cotton Ginner, Certifier			
Input and criteria to enter/begin the process	Crop Schema Planning has taken place (?)This is what has to be completed before this process can begin. For example, for spinning, the cotton has to have been ginned and delivered to the spinner before the process can start			
Parallel Processes				
Activities and associated information (from Activity Diagram) (The first 2 digits are the number of the activity in the activity diagram) All documents and information exchanges involved should be described	DESCRIPTION Indicate: Transformation/aggregation/transaction/object event	Required DOCUMENTS + Who to Who Examples of all documents should be collected	Required OTHER INFORMATION / communication method + Who to Who Examples of emails, pdfs, etc need to be collected	TRACEABILITY Actions and Data required For phase II when we will look at where data has to be collected or processes changed
	3.1 Planning and Ordering - Cotton Crop and order seed and fertilizer – transaction	Order forms for seed and fertilizer from farmer to supplier		

	3.2 Production: Planting, Growing, Harvesting of Cotton Crop – Transformation	Organic Cotton Certificate from Certifier to Farmer		
	3.3 Order/Delivery of Seed: based on order from Farm - Transaction		Order from farmer / email or mobile phone to supplier (SMS/Whatsapp)	
	Etc. Actions 3.4 to 3.8	Etc. Actions 3.4 to 3.8	Etc. Actions 3.4 to 3.8	
	3.9 Reception – Ginner receives cotton – object	CMR – signature by Ginner	Notification from transporter (or Ginner?) to trader of arrival of cotton / email or mobile	
Output and criteria to exit the business process	Cotton Ginner is in possession of the raw cotton <mark>This usually becomes the input criteria for the next process</mark>			
Common exceptions/problems	Location information not correctly provided to truck driver, Chemical fertilizer substituted for natural fertilizer by supplier without notification to farmer, …			
Circular economy related observations	<mark>For example, if there are waste products from this process that could be re-used and/or if one of the inputs could be a recycled product</mark>			
Other Observations				

ANNEX 5 EPCIS Event Descriptions to be reflected in Business Process Descriptions

Basic Event Types to align with EPCIS (Electronic Product Code Information Services)

Transformation event captures the relationship between one or more objects that are fully or partially consumed as inputs or as outputs (3 product parts make 1 product)

Aggregation event objects or processes are grouped (products or batches grouped). For example, several bales of cotton may be put in one container, or several garments in one box.

Transaction event one or more objects become associated or disassociated with one or more business transactions. For example, an object becomes associated with a purchase order or invoice.

Object event an event happened to an object that was not one of the other 3 types of events, for example the object was shipped

For more information: https://www.gs1.org/standards/epcis-and-cbv-implementation-guideline/12#3-Anatomy-of-an-EPCIS-event+3-5-EPCIS-Event-types-and-action