DRAFT TANZANIA STANDARD

Textile – Cotton Industry – Code of Practice

TANZANIA BUREAU OF STANDARDS

0. FOREWORD

This Draft Tanzania Standard is being developed by the Yarns and Twines Technical Committee under supervision of the Textile and Leather Divisional Standards Committee, and it is in accordance with the procedures of the Tanzania Bureau of Standards.

In the preparation of this Draft Tanzania Standard assistance was derived from the following standard:

KS 2857:2019 Cotton industry — Code of practice

In reporting the results of a test or analysis made in accordance with this Draft Tanzania Standard if the final value, calculated or observed is to be rounded off, it shall be done in accordance with TZS 4 Rounding off numerical values.

1. Scope

This Draft Tanzania Standard specifies requirements and recommendations based on best practices for site selection, land preparation, production, harvesting and postharvest management, ginning, lint classing, spinning, seed processing, fabric and finished products manufacture, transportation and marketing of cotton (Gossypium hirsutum) (see flow chart in Annex A).

It is applicable to all players across the cotton value chain including existing and prospective farmers, processors, cotton buyers, extension agents, researchers, regulators and consumers.

2. Normative reference

For the purpose of this Draft Tanzania Standard, the following references shall apply. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies:

TZS 3, *Atmospheric conditions for testing.*

TZS 4, *Rounding off numerical values.*

TZS 53 Edible cottonseed oil- Specification

TZS 691: 2003 General labelling of all products manufactured from textiles.

TDC 5(1102) CD1 Textile fibres – Some methods of sampling for testing.

TZS 833: 2005 Textiles – Cotton bales – Dimensions and density.

3. Terms and definitions

For the purpose of this Draft Tanzania Standard, the following definitions shall apply:

3.1 aggregation store
a store operated by a licensed seed cotton buyer.

3.2 biological control of pests
use of living organisms to regulate pest populations attacking a given crop or plant. Control agents include predators, parasites, fungi, bacteria, viruses and nematodes.

3.3 buying centre
a seed cotton collection store operated by an entity which is licensed to purchase seed cotton.

3.4 chemical disease and pest control
use of chemicals to regulate cotton pests and diseases.

3.5 cotton lint
fibre produced after ginning seed cotton.

3.6 cotton seed
kernel produced after ginning seed cotton.

3.7 cultural disease and pest control
management of diseases and pests without use of chemicals, this includes destruction of crop residues, crop rotation and use of trap crops.

3.8 environment
the physical factors surrounding human beings including land, water, atmosphere, climate, sound, odour, taste, biological factors of animals and plants and the social factor of aesthetics and includes both the natural and the built surroundings.

3.9 ginner
a person licensed to separate seed cotton into lint and cotton seed.

3.10 cotton grade A
seed cotton of superior quality as determined by the authority**.**

3.11 cotton grade B
seed cotton of lower quality as determined by the authority.

NOTE: Grade is a scientific description of the quality of cotton according to the official standards.

3.12 cotton classification instruments
an integrated high speed system for measuring basic cotton fibre quality parameters.

3.13 medium tilth
moderately compact and firm seedbed, which is not cloddy or loose.

3.14 seed cotton
unginned cotton harvested from the field which consists of the seed with the attached lint as picked from the boll.

3.15 spinning consistency index.
a calculation for predicting the overall quality and spinnability of the cotton fibre. The Index is based on individual cotton classification instrument measurements of length, length uniformity, strength, Micronaire and Colour.

3.16 hills
planted hole within a row of cotton planting.

4. Requirements

4.1 Site selection

The site should be located in an area where cultivation is not restricted by any regulatory authority as per existing legislations. The site should be suitable for sustainable cotton production by ensuring that:

4.1.1 The planting area does not contain any residue or contamination of hazardous substances that are likely to be of environmental concern or posing health and safety risk.

4.1.2 In case the planting area is located near or in the vicinity of an industry, or in any high risk area, a risk assessment shall be conducted by regulatory authorities to determine the suitability of production sites. A risk assessment report shall be maintained.

4.1.3 It meets the basic requirements for growing the crop as indicated in the Cotton Industry Act of 2001. The grower shall investigate the temperature, altitude, rainfall (available moisture) for the site and carry out soil analysis to determine soil pH and nutrients. All the corresponding records shall be maintained.

4.2 Land preparation

The land should be prepared at least one month before the expected time of rains or planting for optimum cotton production.

4.2.1 The selected land should be prepared using machinery or manual implements to attain medium tilth in accordance with the Cotton Industry Act of 2001.

4.2.2 In conservation farming, herbicides recommended by Tropical Pesticides Research Institute (TPRI) should be used.

4.2.3 In water logged areas, furrowing is recommended to drain excess water.

4.2.4 In areas with scarce rainfall, tied ridging is recommended for soil moisture conservation.

4.2.5 Soil amendment should be implemented where necessary to bring the site to its optimum production levels.

4.2.6 Where pre-emergence weed control is required, appropriate pre-emergence herbicide should be applied and records maintained.

4.3 Planting

At least one month before the next planting season, all crop residue shall be destroyed without harming the environment.

Planting can take place using machinery or manual implements. Regardless of the seasons and methods (irrigation or rain fed), dry planting is recommended using varieties that are recommended by Cotton Board through Ministry of Agriculture.

Planting should be completed at least one week before onset of the rains and records maintained (planting date, planting depth, seed rate, germination per cent and rainfall data).

4.3.1 Seed

Growers shall check that seeds for planting are packaged, labelled and treated in accordance with provisions of Cotton Board through Ministry of Agriculture. For traceability the farmer shall maintain a record of the source and variety of the seed.

4.3.1.1 Seed dressing with chemicals which have anti-fungal and insecticidal properties, shall be ensured to prevent early pest and disease infestations.

4.3.1.2 The recommended seed rate and spacing for specific varieties shall be observed during planting seed should be placed at a depth of 3 - 5 cm.

4.3.2 **Fertilizer**

4.3.2.1 Farmers are encouraged to use a combination of inorganic and organic fertilizers to improve soil physical and biological properties.

4.3.2.2 The choice of fertilizer and the application rates should be guided by soil test results (see 4.1.3).

4.3.2.3 Records on the type of fertilizer applied shall be maintained by the farmer.

4.3.3 **Gapping and Thinning**

4.3.3.1 Gapping involves replanting empty hills within 3-7 days after germination where the germination is less than 80%.

4.3.3.2 Thinning entails uprooting excess plants 14 days after germination, to attain the recommended plant population and optimize on the nutrient utilization of plants.

4.3.3.3 Records on the date of gapping and thinning shall be maintained by the farmer.

4.4 Weed control

Weeding is the destruction of unwanted plants. This reduces competition for nutrients, water and sunlight with cotton plants and inhibits build-up of pests and diseases in alternate hosts.

4.4.1 Weeding is carried out using physical, cultural, mechanical, biological or chemical methods. The method used should not injure the crop or cause damage to the environment.

4.4.2 Where chemical method is used, the herbicide should be approved by the regulatory authority and farmers should follow instructions for use, provided by the manufacturer.

4.4.3 Records on start and end dates, the method of weeding and type of herbicides used shall be maintained by the farmer.

4.5 Pests and diseases control

To maximize returns, the choice of pesticides and fungicides should be determined by the results of the pest and disease scouting and as per the recommendations given by Tropical Pesticides Research Institute.

4.5.1 During growth period of the crop, scouting should be performed to assess the levels of pest and disease infestation.

4.5.2 Pests and disease control should be managed by using cultural, biological and chemical methods.

4.5.3 Where pesticides, nematicides and fungicides are used, they shall be handled in a manner that ensures the safety of handlers and the environment as guided by Occupational Safety and Health Act (OSHA) and Environmental Management Act of 2004 (EMA).

4.5.4 Records on pesticides, nematicides and fungicides used and their dates of application shall be maintained by the farmer.

4.6 Harvesting

4.6.1 Seed cotton should be harvested immediately the bolls open to preserve quality. Thereafter, it is sorted or classified into grades A and B in accordance with provisions of the Cotton Industry Act of 2001.

4.6.2 Seed cotton should be picked when dry. It is recommended that cotton is dried to attain a moisture content of 11% or less before storage.

4.6.3 During harvesting, it is recommended to use bags made of cotton material to reduce the contamination of the seed cotton.

4.6.4 Avoid the use of sharp or blunt objects that may cause physical damage to the seed cotton during packaging.

4.6.5 Records on weight per grade of seed cotton shall be maintained by the farmer.

4.7 Storage of seed cotton, lint and cotton seed

The two grades (A and B) shall be stored separately to avoid mixing. Seed cotton may be stored in the farm store, collection centres, ginneries or aggregation stores. These stores should meet the following conditions.

4.7.1 Dry, easy to clean and well ventilated to improve air circulation therefore preserve quality of the seed cotton (colour and other physical fibre properties) and to avoid build-up of excess moisture and rotting.

4.7.2 Proofed against rodents, water leakage and direct sunlight. In the case of ginneries and aggregation stores, installation of fire detection and fighting systems is recommended in accordance with the OSHA.

4.7.3 It is recommended to establish a store monitoring schedule (daily, weekly or monthly) to reduce post-harvest losses, based on prevailing environment. A record on store monitoring schedule shall be maintained.

4.7.4 Storage facilities at collection centres, ginneries and aggregation stores shall be approved by the Authority before its use.

4.7.5 The Authority shall schedule annual inspections to operational collection centres, ginneries and aggregation stores to check for compliance with the Cotton Industry Act of 2001. Records of monitoring schedules and inspection reports shall be maintained by the authority.

4.8 Seed cotton marketing

Seed cotton marketing takes place between the producers and licensed seed cotton buyers in accordance with the Cotton Industry Act of 2001. The seed cotton buyer shall meet the following conditions:

4.8.1 Use weighing scales that are calibrated.

4.8.2 Use the guiding floor price as established by various stakeholders under the guidance of the Authority at the beginning of every season to ensure transparency in compliance with the Cotton Industry Act of 2001.

4.8.3 Undertake marketing at the premises (collection centres, aggregation stores and ginnery) licensed by the Authority.

4.8.4 The terms of payment should be as agreed between the parties.

4.8.5 Records on the quantity and quality of the seed cotton purchased, list of the sellers at collection centres, aggregation stores and ginneries shall be maintained by the licensed buyer in accordance with the Cotton Industry Act of 2001.

4.9 Transportation

Transportation of seed cotton by the farmer takes place from farm store to the ginnery, aggregation store (3.1) or to the collection centre (3.3) based on perceived returns. The licensed buyer transports the seed cotton from the collection centre or aggregation store to the ginnery.

4.9.1 To preserve quality, seed cotton shall be transported in respective grades A and B.

4.9.2 The means of transportation shall be clean, dry and properly secured to prevent physical damage, spillage, water, sunlight, dust and introduction of other contaminants.

4.10 Ginning

Ginning is a process of separating the lint (fibre) from seed using a ginning machine by licensed persons.

4.10.1 For best practice, ginning of seed cotton grade A is carried out before grade B. Whenever grade B seed cotton is ginned, the ginning system shall be cleaned before ginning grade A, to maintain the integrity of the lint quality.

4.10.2 The seed should be stored in bags or in bulk at moisture content of not more than 7% for quality preservation and clearly labelled in accordance to TZS 691.

4.10.3 The ginner shall maintain records on weight per grade for seed cotton, lint and seed.

4.11 Lint baling, sampling and labelling

4.11.1 Lint baling

4.11.1.1 Baling is the process of pressing the lint into the prescribed weights and volume and shall be done in accordance to TZS 833. Cotton lint is pressed into bales weighing between 185 to 220 kilograms (Kgs). Other bale weights can be considered depending on the consumer preference and subject to approval by the Authority.

4.11.1.2 Records on the calibration of equipment, weight and grade of each bale shall be maintained.

4.11.1.3 Bales shall be wrapped using high density polyethylene paper or cotton cloth to preserve lint quality and secured using natural or synthetic fibre material lashings. Bales of different grades should be stored separately to avoid mix up.

4.11.2 Lint sampling

4.11.2.1 Lint samples shall be collected from each bale by the ginner during the baling process. The lint samples shall then be labelled, packed, transported and delivered to the Authority in accordance to the Lint Sample Collection Protocol for classing (see 4.12 (lint classing).

4.11.2.2 Samples collection from other sources shall be taken in accordance to methods prescribed by ISO 1130 (TDC 5(1102) CD1).

4.11.2.3 Records shall be maintained by the ginner on the samples in accordance with lint sample collection protocol.

4.11.3 Lint bale labelling

The bales shall be labelled legibly and indelibly in accordance to TZS 833 with the following information:

a) product name;
b) grade;
c) client name (mark of the producer);
d) year of crop harvest (date of production);
e) lot and bale numbers;
f) bale net weight in kg;
g) type of gin;
h) cotton variety; and
i) country of origin.

NOTE: Where ink is used for labelling; it should not penetrate to the lint to avoid its contamination.

4.12 Lint classing

Lint classing is characterization of cotton by determining a number of quality parameters; primarily length, strength, colour, micronaire (fineness and maturity) and uniformity.

4.12.1 After receiving the lint samples from each bale, The Authority classifies the lint by determining physical attributes using Cotton classification instruments to establish the quality of the lint to promote trade, market access and maintain consumer confidence.

4.12.2 The calibration status of the cotton classification instruments shall be maintained.

4.12.3 Records shall be maintained for maintenance, instrument calibration and lint classing data by the Authority.

4.13 Lint marketing

Ginneries are the main source of lint for processing by the spinning industries. Marketing of lint is mainly influenced by quality levels, global stocks and source (country) which directly impacts the price. In addition, lint prices may be affected by the cost of other fibres and the fluctuation of exchange rate**.**

4.13.1 The spinning industries are the main market outlets for lint. The industry prefer consistency (low variability) in lint quality between different batches in order to achieve better spinning process efficiency.

4.13.2 Records on lint stocks shall be maintained by the ginner.

4.14 Spinning

Spinning is the process of converting fibre into yarns using a range of spinning technologies and equipment which are manual or mechanical. The technology and equipment used will depend on cost, yarn quality and throughput. Preferably, spinning should start after establishing the spinning consistency index during lint classing. The index assists in bale lay-down with the aim of optimizing the process.

4.14.1 The equipment shall comply with safety requirements in accordance to OSHA. To ensure safety, a monitoring schedule of the equipment, status report, energy consumption and any follow up actions shall be maintained by the Spinner.

4.14.2 Records shall be maintained on the source and quantity of lint consumption and yarns produced to determine the process efficiency.

4.14.3 Waste generated shall be reused or disposed and records maintained in accordance to EMA and OSHA.

4.15 Cotton fabric manufacturing

Cotton fabric manufacturing may be carried out using non-weaving, weaving or knitting processes in facilities approved the OSHA and by any other applicable legislation. The process adopted depends on the desired end product.

4.15.1 Nonwoven fabric is prepared directly from lint without spinning process where mechanical entanglement or resin bonding of fibres takes place to form a fabric.

4.15.1.1 In woven fabric manufacture yarns run lengthwise and width-wise by interlacing.

4.15.1.2 Knitting is the art and science of making fabric by interloping yarns around and through one another.

4.15.2 The fabric may be dyed or printed and further processed in readiness for garment manufacturing for purposes of value addition.

4.15.3 Fabric manufacture generates various waste materials which should be disposed and records maintained in accordance to EMA and OSHA.

4.15.4 Records shall also be maintained on quantity and range of products, energy consumption, type and quantity of dyes used by the cotton manufacturers.

4.16 Marketing of finished products

The finished cotton products offered to the market shall comply with the requirements stated in the respective standard specifications.

4.16.1 The products should be offered to the markets through licensed outlets approved by relevant Authorities.

4.16.2 Records shall be maintained on sales, inspection and testing of the finished products.

4.17 Seed processing

Seed processing is the mechanical pressing, solvent extraction or a combination of the two approaches to produce oil and seed meal performed by seed processors or ginning factories to allow further value addition

4.17.1 The cotton seed processor should employ optimal methods of cotton seed processing including cleaning, drying, linters removal, dehulling, flaking, cooking and extrusion to ensure production of quality seed meal and efficient oil recovery. The equipment used should be operated, maintained and calibrated as per the manufacturer's recommendations.

4.17.2 Records shall be maintained on quantities of processed materials, oil recovery efficiencies, energy consumption, maintenance and calibration data.

4.17.3 Cotton seed oil is processed into edible and industrial cotton seed oil.

4.17.3.1 The edible cotton seed oil shall comply with TZS 53.

4.17.3.2 Industrial cotton seed oil may be used in the manufacture of soaps, bio-diesel and paints complying with respective product Tanzanian standards.

4.18 Marketing of cotton seed cake and oil

Cotton seed cake is widely marketed as a protein supplement feed for ruminant animals and is of special value to the dairy industry because it increases the butter fat content of milk.

4.18.1 The main markets are ruminant animal feed manufacturers. Additionally, dairy farmers purchase a substantial amount of the seed cake. Seed cake processed from dehulled cotton seeds fetch premium prices as compared to cake from whole seed processing.

4.18.2 The edible oil is marketed almost exclusively to food formulation and processing industries. It is sold directly as a vegetable oil for consumption as a specialty frying oil highly priced for toasted or nutty aroma which it imparts to snack foods. It is widely used in formulation of solid fat products because it forms small crystallites that provide these products with a smooth consistency, fluid plasticity and a preferred mouth feel.

4.18.3 For greater market access and visibility, advertising through multimedia is recommended.

4.18.4 Records shall be maintained on cotton seed cake and oil produced and sold by the manufacturers.

Annex A
(normative)

Flow chart

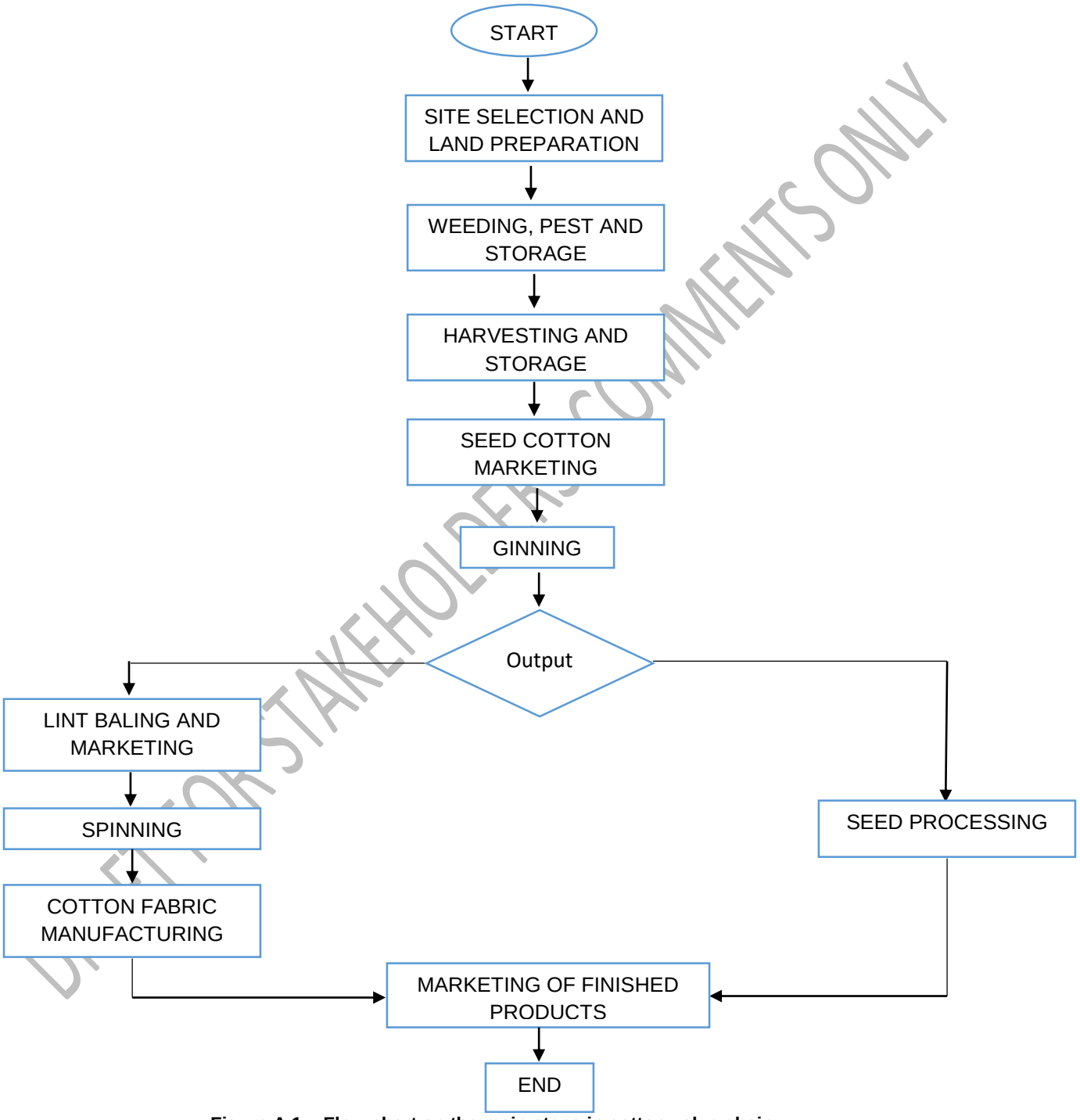

Figure A.1 – Flow chart on the main steps in cotton value chain

Annex B
(informative)

List of records

B.1 A risk assessment report on suitability of production site (4.1.2)

B.2 Site assessment report (4.1.3 and 4.2.5)

B.3 Planting records (4.3)

B.4 Weed, pest and disease control records (4.4 and 4.5)

B.5 Harvesting record. (4.6)

B.6 Store monitoring schedule record (4.7)

B.7 Seed cotton marketing and transportation record (4.8 and 4.9)

B.8 Ginning and sampling records (4.10, 4.11 and 4.13)

B.9 Instrument calibration and lint classing records (4.12)

B.10 Equipment status, energy and lint consumption and yarn production reports (4.14)

B.11 Energy consumption, type and quantity of products and dyes (4.15)

B.12 Sales, inspection and testing records (4.16)

B.13 Quantities processed, stocks and equipment records (4.17 and 4.18)