



Rwanda Ikawa Nziza Cyane (INC) “Best Coffee Quality” Project



Quality and Sustainability Guidelines for Coffee Washing Stations

Funded by the European Union and JDE Peets, in cooperation with the Government of Rwanda.

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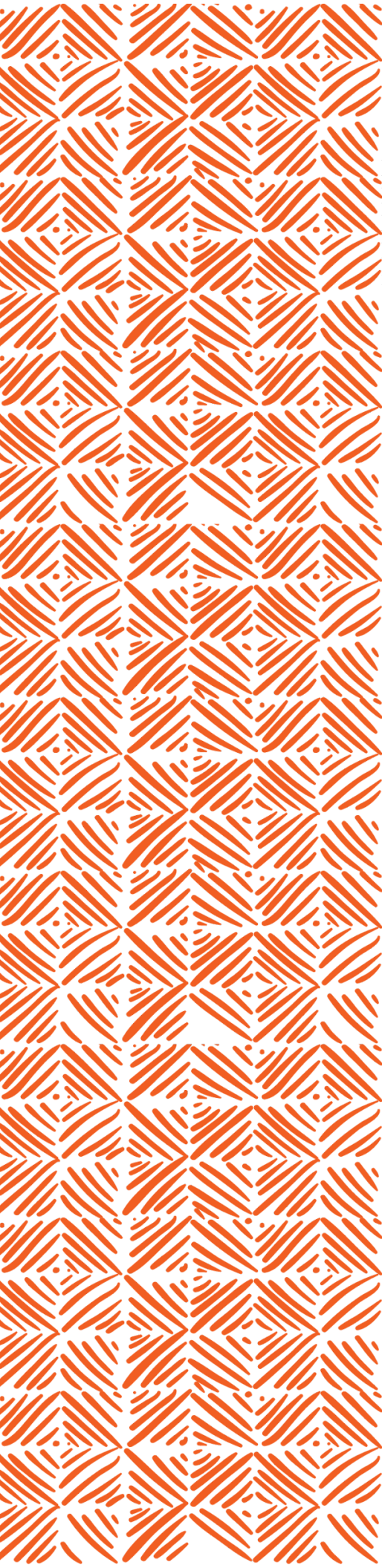
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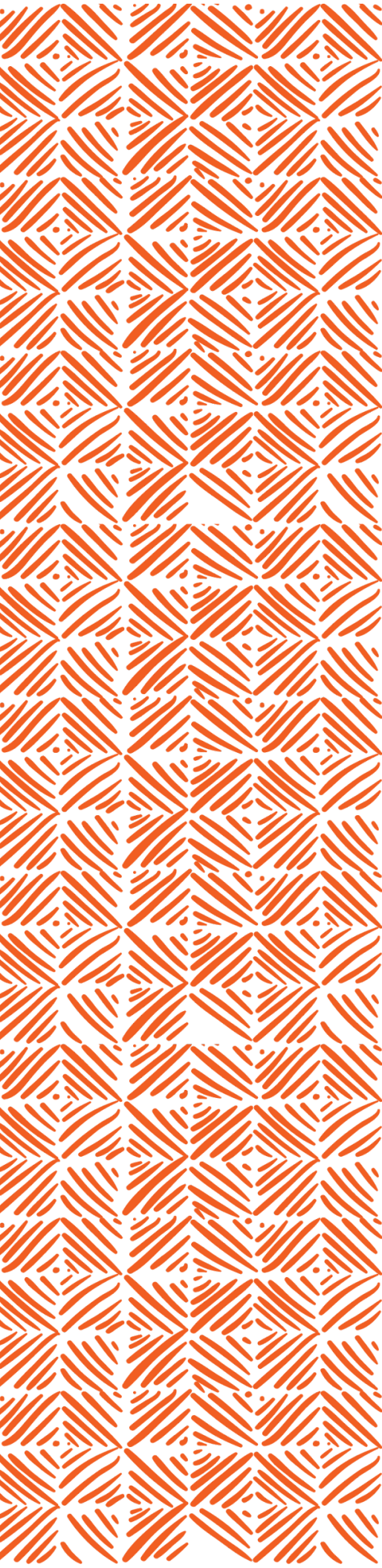
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CONTEXT

This document outlines the recommended quality and sustainability guidelines for coffee washing stations in Rwanda. It is not a coffee washing station (CWS) manual, but it is intended to identify measurable, tangible standards affecting coffee quality, social and environmental sustainability at each step of coffee processing at coffee washing stations.

These standards were first drafted by TechnoServe and the Coffee Quality Institute (CQI) in close collaboration with the National Agricultural Export Development Board of Rwanda (NAEB). This work has been funded by a grant from the European Union as well as the global coffee company JDE Peet's.

AUDIENCE

- CWS managers
- CWS owners (if privately held)
- Exporters
- Regulators

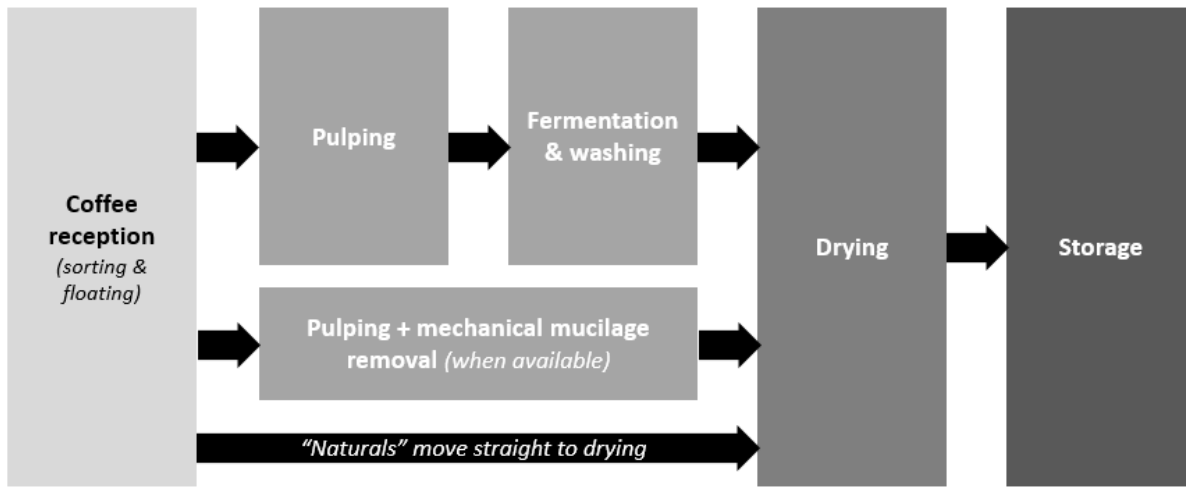
RATIONALE FOR PROCESSING STANDARDS

There are various reasons to establish unified guidelines for quality and sustainability at the coffee washing station level:

1. Ensure that Rwandan coffee washing stations are efficiently delivering the best possible quality (and quantity) of coffee to become a preferred origin for international specialty coffee buyers and ultimately secure greater price premiums for Rwandan coffee and higher payments for its farmers.
2. Make Rwandan coffee washing stations aware of key practices and acceptable thresholds related to preserving Rwanda's natural environment.
3. Verify that Rwandan coffee washing stations are aware of key practices and acceptable thresholds related to protecting the rights of employees.
4. Ensure that Rwandan coffee washing stations are equipped to adapt to climate change.

In addition to defining quality and sustainability standards for coffee washing stations, this document includes several additional best practices exceeding the minimum quality standard threshold, as well as checklists and protocols that CWS managers, exporters, regulators, and auditors may choose to adopt to help monitor and assess activities at the CWS.

Figure 1. General Diagram of Coffee Washing Station Activities



1. COFFEE WASHING STATION EQUIPMENT (E)

A CWS needs a minimum level of infrastructure and equipment to produce high quality specialty coffee. The exact requirements of each CWS will depend on its volume of production, availability of resources, and quality objectives. The following list represents the minimum equipment and infrastructure requirements to ensure that coffee quality can be adequately preserved and measured at each step in the process.

MINIMUM RECOMMENDED EQUIPMENT & INFRASTRUCTURE

- E 1 – Tarpaulins (plastic sheets) or cherry sorting tables for sorting cherries at collection site
- E 2 – Buckets or tanks to float coffee cherries (if mechanical demucilager not used)
- E 3 – Coffee pulper
- E 4 – Scales to weigh coffee cherry and dried parchment
- E 5 – Fermentation tanks
- E 6 – Washing channel (if mechanical demucilager not used)
- E 7 – Squeegees and stoppers for parchment washing and grading (if mechanical demucilager not used)
- E 8 – Drying tables
- E 9 – Shade nets and Nylex (cover tarp)
- E 10– Parchment bags
- E 11– Pallets
- E 12– Calibrated coffee moisture meter
- E 13– Appropriate spanners and screw drivers to calibrate pulping machine

ADDITIONAL RECOMMENDED EQUIPMENT

- E 14– pH meters to monitor fermenting coffee and identify the washing point
- E 15– Hygrometers to monitor and record the moisture level of the relative humidity
- E 16– Thermometers to monitor air temperature and temperature of fermenting coffee tanks
- E 17– Water meter to measure water usage
- E 18– Temperature meter to monitor bean temperature during drying
- E 19– Ripeness board to assess and categorize cherry ripeness

MINIMUM RECOMMENDED DOCUMENTATION

- Cherry receipt book
- Daily lot tracking sheet
- Storage records
- Water usage tracking sheet
- Lot label indicators for drying beds
- Fermentation records

2. COFFEE CHERRY SORTING (CCS)

Cherry ripeness (through selective harvesting) is crucial to the production of high-quality coffee and presents a win-win for both the farmer and the CWS. Upon reception, sorting mitigates quality risk by (1) removing potential machine hazards and contaminants; and (2) separating out any lower quality cherries.

MINIMUM RECOMMENDED PRACTICES

CCS 1 – Selective harvesting: Harvest coffee by selective harvesting of bright to deep red, ripe cherries. Do not harvest unripe or immature cherries. Ripe cherries also have more water and are more than 30% heavier than green or overripe cherries.

Additional notes on harvesting:

- Do not delay harvest until cherries are overripe or dry.
- Avoid picking the stalk from which the cherry is attached to the tree. When selectively harvesting ripe cherries, it should easily detach from the coffee tree.
- Use clean containers to harvest and keep harvested coffee out of the sun (under shade) as much as possible.
- Cherries that have fallen to the ground before harvesting should not be mixed with harvested cherry since they are generally old and of inferior quality.
- It is important to sort cherries before delivery to the purchase point as this saves farmers time and reduces the quantity they must carry, as well as limiting rejected cherries to carry back home.
- The overripe, unripe, and other discarded cherries can be dried and sold separately in the local market as natural processed. Where paid labor is used, pay harvesters more for fully ripe cherries, less for overripe cherries, and even less for unripe cherries to create the right incentive system. Any unripe cherry picked presents a business loss to the farmer.

CCS 2 – Transport of cherries: Package and transport coffee cherries in clean bags that allow for proper ventilation. If the bag is not ventilated, then poke small holes with a needle to improve ventilation. Keep shaded and do not put any heavy objects on top of the coffee. Ensure cherries are not left inside the harvest bags.

CCS 3 – Cherry arrival: All coffee cherries should be delivered the same day of the harvest. It is advised to pulp coffee within 8 hours (maximum) of picking to preserve quality. Therefore, it is advisable to encourage farmers to harvest and deliver early in the day to start pulping as quickly as possible (e.g., before 15:00).

CCS 4 – Initial sorting: All coffee cherries should be laid out on a clean floor or sheet and sorted on arrival, **prior to accepting**. This is done to remove unripe, overripe, and damaged cherries to achieve target ripeness. **Upon reception of cherries, at least 95% of the lot should meet ripeness specifications** – red to uniform purple-red over the entire surface of the cherries. (Target cherry maturity is a range of colors that will meet the needs of the station and will depend on the local coffee variety or varieties delivered.)

To ensure transparency and analysis of data, percent maturity should be recorded in a register, along with weights delivered. See Annex A for procedure to determine percent ripeness.

Cherries that do not meet the maturity target will be separated and treated as a lower quality batch throughout the entire process – whether processed through the CWS or by the natural method (whole dried cherry)- and will be sold separately to the local market.

Figure 2. Coffee cherries at various maturations.

The red box outlines coffee cherries at peak maturity, though this scale may change with different cultivars. Image: CQI.



CCS 5 – Coffee cherry weighing: The farmer receives payment according to the weight and quality of the raw material delivered. The weighing scale must be properly calibrated and accurate.

CCS 6 – Water flotation sorting: At reception, water flotation sorting should be in place and the floating coffee must be separated out and prepared separately from the non-floating cherries. This step can be skipped when a mechanical demucilager is used.

CCS 7 – Manage workflow of cherries through the washing station: The goal is to process the cherries within 8 hours of their harvesting. If the coffee received will not be processed shortly after arrival, it is recommended that the received coffee be kept in a shaded and well-ventilated area where the coffee does not risk over-fermentation. If this is not possible, and the coffee becomes too hot, it may be soaked in clean, cool water for a short period of time until it is ready to pulp. If there is a fermenting smell, process and track the coffee as a separate lot. In addition, it is recommended that lots be processed in order of quality, **from highest quality to lowest, on a daily basis.**

3. COFFEE CHERRIES RECEPTION (CCR)

The quality potential of a coffee washing station is directly related to the quality of cherries that it receives.

MINIMUM RECOMMENDED PRACTICES

CCR 1 – Prepare for cherry reception: The CWS must prepare all the necessary equipment in the reception room (producers' sheets, vouchers, scales, pens, buckets, means of payment, etc.) each day of coffee reception.

CCR 2 – Ensure scales are calibrated: The weighing scale must be properly calibrated at least once annually (beginning of season) according to national regulations.

CCR 3 – Keep unique records for each farmer: A receiving log (farmer's sheet) should be kept which will record all deliveries in quantity, quality, percent ripeness, date, purchase price, and any other information deemed necessary.

A unique identification code should be assigned to each producer. See example in Annex C.

A delivery receipt should be issued to each farmer, which they should keep for their own administration. Carbon copies should be kept for the CWS's (recommended to have one copy at delivery point and one copy at CWS office).

CCR 4 – Record additional information for each farmer: The farmer's file may allow data entry with various other information (address, identification, location of the plantation, family status, etc.) It is recommended to make a file for each coffee season but to keep the same identification code for the farmer.

ADDITIONAL RECOMMENDED PRACTICES

CCR 5 – Manage reception inputs and set daily goals: Coffee reception days should be determined by the management team and based on the quantity estimates of the cherries that will be delivered. For example, per day less than two tons, less than 10 tons, etc. The CWS manager must also follow a management manual to hire the necessary personnel – normally according to the quantities delivered per day.

CCR 6 – Ensure the reception area is clean and organized: A clean and organized reception area is not only a hygienic requirement, but it also facilitates the decision-making that occurs. Furthermore, it demonstrates the quality standard of the CWS operation to those delivering the coffee, those working at the CWS, and for potential coffee buyers who wish to visit. Use only clean water and food-grade detergents (when needed) for infrastructure and equipment cleaning.

CCR 7 – Payment transparency: The CWS manager should record daily purchases of cherries, whether in cash or credit. These sums comply with the indications in the purchase order books and receipts. It is highly recommended to use electronic payment whenever possible.

4. PROCESSING METHODS (PM)

Despite the variability in processing methods, the key guiding principles of post-harvest processing are (1) **uniformity** and (2) **risk mitigation**. Post-harvest processing entails removing different parts of the coffee cherry that surround the seed before drying, and can be conducted in various ways. The most common processing methods in Rwanda are washed processing (78%), demucilaged processing (including semi-washed and honey (19%)), and cherry-dried processing/natural (3%).¹

4.1. CHERRY PULPED PROCESSING METHODS (FP)

Cherry de-pulping consists of removing the skin, and part of the mucilage, from the cherry. This is normally implemented in washed, honey, and semi-washed processes. This step initiates a chemical response inside the seed, but it also exposes the coffee to risks of defect development if not monitored correctly. A pulper machine in good working order is essential to ensure a good quality output separating pulp from beans while avoiding cracking or bean loss.

Minimum Recommended Practices

FP 1 – Pulper must be calibrated: A properly calibrated pulper ensures that beans are not damaged and that minimal pulp passes through the parchment coffee outlet. The machine operator may calibrate at the beginning of the season and then as needed depending on pulper output.

To check the calibration of the pulper, it is good practice to use a 0.5-liter capacity container and regularly take samples at the machine exits (coffee and pulp). If the machine has several outlets, samples should be taken from each outlet. The frequency of sample collection may vary depending on use (coffee volume) per day. It is usually a first visual observation of the person in charge of handling the machine that will give the first warning signal.

- For every batch of cherries processed using a disc-pulper, if the un-pulped cherries being sifted out are more than 5%, re-adjust the breastplate, screen, or chops accordingly.
- After loading one batch of cherries, look at the pulped output and randomly inspect beans. If any more than 5% of the beans are defective (cracked or contain too much pulp), re-calibrate accordingly.
- Check that there are no un-pulped beans in the pulp output, then proceed with pulping until all the coffee is pulped.

FP 2 – Pulper safety and operation: The machine's user manual, normally provided by the manufacturer, must be available at the CWS. It is also essential to have the appropriate tools to be able to adjust the machines. The way to adjust the machine is normally indicated in the manufacturer's manual. If this is not available, it will be necessary for the technician assigned to manage the machine to undergo training. In principle, it is a matter of tightening and loosening bolts, but it must be done correctly and with the right tools.

¹ NAEB data: 2020 coffee season

Each coffee pulping machine should have a recommended/suggested volume per hour capacity. To calculate the daily pulper capacity, multiply the hours of operation by the per hour capacity of the machine.

FP 3 – Pulper condition: The machine should be cleaned well at the end of each day with clean water (do not use soap) and make sure that no coffee beans or pulp are stuck in the machine. Otherwise, there will be a risk of contamination by leftovers, which leads to loss of quality. The maintenance of discs or screens on the pulper machine is also linked to the quantity of coffee processed, and these should also be checked and maintained regularly throughout the season.

FP 4 – Record keeping for machine maintenance: It is recommended to have a book dedicated to monitoring each available pulping machine. Each time the machine is operated, the useful data must be recorded on the same day. An example of data to record:

- Date
- Fuel consumption (liters) or electricity consumption (Kwh)
- Maintenance observation (oil, lubrication, etc.)

FP 5 – Water quality and availability: Pulping water should be clean. Ensure the water is adequate to pulp and wash all the parchment coffee processed for the day. As much as possible, limit the amount of water used during pulping. While using disc pulpers, the recommended volume of water is 40 litres per Kilogram parchment. For eco-pulpers the recommended volume of water is 0.3 litres per Kilogram parchment.

4.2. WASHED PROCESSING (WP)

There are several variations of the washed process, all of which include fermentation to break down sugars, followed by washing to remove pulp and mucilage. It would be impossible to describe all variations. However, there are commonalities that can be standardized.

MINIMUM RECOMMENDED PRACTICES

WP 1 – Begin a controlled fermentation process: After the coffee cherry is pulped, parchment coffee with mucilage intact is placed into a tank for fermentation. The tank should be under the shade and protection of a roof to ensure no direct sunlight or rain is able to enter. The time between when the first parchment enters the tank to when the last parchment is added to the same batch should be minimized (one-hour maximum) to keep processing conditions uniform. Delays in processing after harvest can lead to uncontrolled fermentation within the cherry. Delays during pulping that slow the filling up of the tank can lead to uneven fermentation.

Drain the tank of pulping water and ensure no new water seeps into the tanks (as water will slow fermentation). Cover the tank at night with a plastic sheet to retain heat and reduce temperature fluctuations between day and night. The fermentation tank should be made of materials that resist high acidity and do not leak into coffee beans.

WP 2 – Define the washing point: The washing point is the point at which a coffee is adequately fermented and is ready to be washed. This is a critical parameter to preserve coffee quality. The definition

and measurement of the washing point of each fermentation tank should be standardized at each CWS, specific to local conditions and mill practices.

Ideally, along with visual and audio clues, processors will include factors such as pH, time, and coffee mass temperature. There is not an ideal fixed time, temperature, or even pH for coffee fermentation. However, by recording these factors and seeing their correlation with the quality of the resulting coffee beverage, processors may gain a better understanding of how to maximize the quality of their coffee through fermentation within the realities of their own production.

The temperature of the fermenting coffee should be monitored. If temperature is too low, the growth of microorganisms will decelerate. If the temperature is too high, it could impact coffee quality. Processors should keep coffee mass temperature close to or below 20 degrees Celsius.

WP 3 – Check each tank for washing point regularly: During the peak season, coffee is often processed late at night and in the morning; checking the wash point is often overlooked. The CWS must be strict to make sure this practice is adhered to each day during fermentation.

Methods to check if fermentation is complete:

- **Feeling by hand and washing the parchment:** Use clean hands to rub the parchment together, then wash the coffee with water. Fermentation is complete if the coffee produces a clearly audible gritty sound when rubbing it between hands and the mucilage washes away. This is the best method to check whether fermentation is complete.
- **Broomstick method:** Drive a broomstick into fermenting parchment and pull it out in one stroke leaving behind a hole. Fermentation is complete if the hole does not collapse. If the hole collapses (caves in) then the coffee should be left to ferment a little more.
- **Measuring equipment:** While not necessarily superior, an alternative method to determine fermentation completion is to use a pH meter to monitor the fermentation process. During the fermentation process the pH will drop as organic acids are produced, while highly context specific, generally the pH value should not drop any lower than 4.5. However, the final pH number should not be used as a definitive determining point for the washing point. pH levels can be impacted by the starting pH of the coffee entering the tanks, type of water used, ambient conditions, etc. This data point should be used in conjunction with the above methods to make a washing point determination.

WP 4 – Clean fermentation tanks thoroughly with clean water (and food grade detergent if needed): Before receiving parchment, check and remove any parchment from previous fermentation. Unclean tanks will influence the fermentation process and result in inconsistent fermentation across batches. As always, monitor and minimize water use.

WP 5 – Maintenance of fermentation tanks and washing channels:

- At the end of the season, repair the fermentation tanks and the washing channels, sealing any cracks and damages sustained throughout the season.
- If the surface of the tanks is tiled, replace any worn-out or broken tiles.
- If the tanks and washing channel have a concrete surface, use appropriate paint to repair and paint the worn-out surfaces and cracks.

- Make sure there is a roof built over the fermentation tanks to provide shade and regulate an even fermentation by avoiding direct sunlight and protecting against rain entering tanks.

WP 6 – Keep daily batches and grades separate and tracked: It is recommended to assign a batch number for each lot processed for traceability purpose.

ADDITIONAL RECOMMENDED PRACTICES

WP 7 – Keep a fermentation record: The fermentation process should be followed by noting important data, including:

- Date
- Lot size
- Hours in tank and time washing point reached
- Temperature
- Acidity (pH)
- Texture
- Odor

This information should be used to create a log of data that can be analyzed over time. From the analyses of such a log, trends correlating local parameters and quality/flavor can be noticed and used to improve practices. Note, the CWS may choose to keep a comprehensive ‘traceability log’ that includes not only the fermentation batch information described above but also the other information related to that batch upon reception (e.g., pulping date, grade, lot number, conditions of fermentation, drying, and storage).

WP 8 – Use of a grading channel: If the washing station is equipped with a grading channel, a separation will naturally occur due to differences in bean density that can then be made to separate the three grades. The grades that will give the best qualities are typically dense (heavy) beans. The denomination of these grades will depend on the customs of the country or its regulations, and the proportion shall preferably be not less than 90% for the first grade.

4.2. MUCILAGE REMOVAL PROCESSING (MRP)

Note: This section includes honey and semi-washed where the fermentation is skipped and the pulped (and/or demucilaged) coffee moves straight to the drying tables.

The coffee is pulped, and the left-over mucilage is removed mechanically by friction using a machine called a mechanical demucilager. The mucilage remover can be regulated to determine the amount of mucilage you want removed (to create yellow or red honey). The mucilage removal can also be skipped altogether, and pulped parchment can be directly dried (black honey) depending on the objective of the CWS. In honey processing, the amount of mucilage left on the coffee seed is intentionally controlled by the processor to achieve desired flavors. Alternatively, the mechanical demucilager can be incorporated into the Washed Processing method allowing the shortening of the fermentation time. One option

practiced in Rwanda is to remove 90% of mucilage using the mechanical demucilager followed by underwater fermentation overnight and washing the following morning.

MINIMUM RECOMMENDED PRACTICES

MRP 1 – Keep pulper and mucilage remover calibrated: These are the same recommendations as for those relating to the pulper, but in this case they should be applied to both the pulper and mucilage remover. See section 3 (CCS).

MRP 2 – Clean pulper and mechanical demucilators at least once daily: The cleaning of the machines with clear, clean water (no soap or chemicals) is very important in mucilage removed coffees because mucilage is concentrated and forms a very messy, sticky, and corrosive kind of glue. If the cleaning with water is not done quickly it becomes difficult later and contaminates future lots with fermented flavors.

4.3. CHERRY DRIED PROCESSING (CDP)

In the dried cherry processing method, also called natural processing, no pulping machine is used. After the selection/sorting step, the cherry is directly spread on the drying tables in a single layer during the first days. It is necessary to have good drying capacity to consider a large production of natural coffee.

MINIMUM RECOMMENDED PRACTICES

CDP 1 – Initiate CDP method only after the dry period begins: In countries with high rainfall, such as Rwanda, it is safer to wait until the dry period to produce natural coffee. If natural coffees are re-wetted during drying, quality will be compromised, and the coffee may not generate a return on investment.

CDP 2 – Sort with extreme care prior to drying: A strict sorting should be done on arrival. This includes sorting for ripeness targets (i.e., 95% consistency in color) as well as washing and floating cherries to separate out all floaters.

CDP 3 – Stir the drying coffee continually in first drying days: As in the case of MRP, above, it is especially necessary in the first days of drying to stir the coffee as often as possible, to eliminate the risk of mold appearing and quality loss.

5. DRYING (D)

Proper drying is one of the most critical (and often mismanaged) steps necessary to preserve the quality of the bean. Ultimately, the parchment coffee is considered dry when its **moisture content is between 10%-12%** (by weight on wet basis).

MINIMUM RECOMMENDED PRACTICES

D 1 – Calculate drying space needed: Often, the available drying space is the biggest bottleneck at a CWS. This stage not only depends on having dedicated space over an extended period, but it also depends greatly on the weather. Being able to manage your drying areas effectively and efficiently is a significant component of producing high-quality, consistent coffees.

To calculate the drying space needed, assume that 1m² of drying space will hold roughly 10-12kg of dry parchment (12-15kg of wet parchment). Compare your total drying capacity divided by the average number of drying days during peak season to your daily pulping capacity. If the pulper capacity is much larger, consider adding more tables at the beginning of the season if you expect to operate close to capacity during peak season.

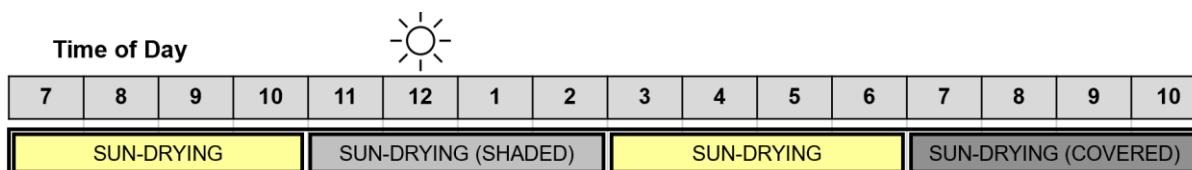
D 2 – Do not allow coffee to experience high temperatures: The coffee bean temperature should not exceed **35** degrees Celsius for parchment coffee and **40** degrees Celsius for natural coffee. See below for recommendations on how to control temperature and shade.

D 3 – Pre-dry out of direct sun: For washed coffees, there is the pre-drying step which allows the coffee to drain and lower the humidity level from 60% to less than 50%, while also allowing CWS personnel to continue to sort for removal of visible defects. Sorting by hand is easier at this time because the parchment remains translucent for a few hours. If this takes place, it is recommended that this pre-drying operation be done under shade cover to avoid overheating too quickly in direct sunlight.

D 4 – Depth of parchment on drying tables: The depth of parchment should not exceed 5 cm on final drying tables. A practical way to verify this is to place an index finger vertically in the parchment at the middle of the table to see if the parchment reaches above the halfway mark of one's finger (approximately 5 cm).

D 5 – Parchment coffee on drying tables should be turned constantly: Ideally every 2-3 hours, and at least four times daily, for fast and uniform drying.

Figure 3. Drying periods



Time of Day															
7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10
SUN-DRYING				SUN-DRYING (SHADED)				SUN-DRYING				SUN-DRYING (COVERED)			

Parchment should be covered during rain and at night to avoid rewetting which affects quality. In addition to direct rain, morning dew will also rewet beans so use shade net cover during the night under the Nylex to avoid direct contact between the Nylex and parchment.

D 6 – Lot separation: Drying must maintain the integrity of separated lots. Lots should be clearly labeled. Similarly, drying tables should be clearly numbered to help with tracking different lots. It is recommended to put a wooden tag on the table with the pulping date, grade, lot number, table number, and person responsible for the lot during drying.

D 7 – All coffee should reach a final moisture level of 10-12%: The final moisture content of coffee should reach between 10-12% by weight. This should be measured with a coffee moisture meter which has been properly calibrated and used according to manufacturer directions. After this point, the coffee should never take on additional moisture and be kept in a cool, well aerated place.

D 8 – Keep drying tables, patios, and other surfaces or enclosures well maintained: Staff should be made aware of a visual inspection of drying tables and all other drying surfaces and enclosures so that any repairs can be done regularly.

ADDITIONAL RECOMMENDED PRACTICES

D 8 – Drying should be monitored and recorded: A logbook to monitor the drying should be kept up to date recording the various measured parameters related to each dried lot. Staff should be trained in the use of all measuring devices. Parameters that can be monitored as standard practice include:

- Moisture of the coffee bean should be monitored during drying using a coffee moisture meter.
- The humidity and temperature of the ambient air should be monitored using a hygrometer.

6. STORAGE (S)

The storage of dry coffee requires **four operations**:

- Transport the dry coffee to the store
- Fill and weigh the bags
- Sew and label the bags
- Store the bags

MINIMUM RECOMMENDED PRACTICES

S 1 – Ensure proper facilities: The storage location should be dedicated to coffee only. Facility should have smooth walls without seams. Some additional considerations:

- The door should fit snug with no cracks.
- The store should be well ventilated, with open ventilation windows, if possible.
- The inside and outside of warehouse is clean with no traces of insects.
- Clean pallets should be placed so that there is at least 15 cm between the wall and the coffee. The coffee must not have any direct contact with the ground. Always stack coffee bags on pallets.
- The warehouse should be kept clean and swept. Above all, there should be no bad smells or smoke, and no chemicals present.
- Ensure daily control of the storage relative humidity and temperature to control possible rewetting.
- Ensure the availability of the safety hazard control program (Fire extinguisher, smoke detector, etc.).

S 2 – Keep good records in the storage facility: The storekeeper must properly establish the storekeeper record document. This sheet must always be up to date and correspond to stocks.

S 3 – Scale should be calibrated in warehouse facility: A well-calibrated scale should be assigned to the storage warehouse.

7. GENERAL EQUIPMENT MAINTENANCE (EM)

Poor maintenance of processing equipment will have a negative impact on coffee quality. This could result in broken or damaged seeds and contamination by oils, rust, mold, and off-fermentations, amongst others. Maintenance records (plan and reports) should be logged regularly in appropriate documents.

MINIMUM RECOMMENDED PRACTICES

EM 1 – Keep all technical documents in a centralized and organized location: The technical documents of the machines must be as complete as possible, well-organized, and accessible.

EM 2 – Experienced personnel should be employed: It is recommended to assign qualified staff (quality controller, mechanic, etc.) with sufficient experience and training – especially during the coffee season.

EM 3 – Keep equipment records: A history record sheet should be established for each equipment used in coffee processing with, for example, installation date, supplier's address, date of maintenance, spare parts replaced, etc.

EM 4 – Keep extra equipment parts available: Always have sufficient stock of critical spare parts to avoid delays due to lengthy ordering processes.

EM 5 – Conduct end-of-season inventory and maintenance: At the end of the harvest season, proceed with the complete disassembly of the machines to inspect all the components and replace the excessively worn parts.

8. OPERATING COST MANAGEMENT (OC)

The two key aspects to monitor processing costs are (1) coffee conversion ratios and (2) capacity utilization rate:

OC 1 – Outturn ratios: Outturn ratios show how efficient you are in turning cherry into parchment and parchment into green coffee. These ratios can be used to evaluate quality of raw material, detect processing issues that could impact quality, highlight potential theft, and ensure cost effectiveness. A more precise and detailed breakdown of outturn ratios can be found below.

Table 1. Breakdown of Outturn Ratios

STATE OF COFFEE	KG PER 1 KG OF EXPORT GRADE GREEN COFFEE
Fresh fruit (fresh cherry)	6.49
Dry fruit (dry cherry)	2.63
Freshly pulped coffee	3.96
Washed and drained parchment	2.70
Dry parchment	1.46
Green coffee	1.17
Export grade green coffee	1

OC 2 – Grade categories: In addition to outturn ratios, it is important to monitor the grade categories of the parchment:

- **Grade A** parchment is derived from both the main output and re-passed output, which stays behind as the densest coffee in the grading channel. For stations where there is no grading channel, it consists only of the main output of the pulper.
- **Grade B** consists of both the main and re-passed output, which is graded in grading channel as of lighter than grade A but heavier than the lightest or floating beans. For stations where there is no grading it only consists of re-passed coffee or cherry pulped outside of the main pulping hours.
- **Grade C** consists of all floating and lightest pulped parchment (or floated as cherries and separately pulped) plus all sorted-out parchment at skin-drying table.
- As a rule of thumb, the CWS is expected to have **90% of grade A output and <2% of grade C.**

However, at the beginning and at the end of the season, the grade A output percentage is expected to be lower (through lot separation, the coffee produced during the tail ends of the season can be cupped to determine whether to sell them separately). If the grade A output is below 90% during the main harvest period, implement stricter cherry reception quality control.

OC 3 – Washing station capacity utilization: The CWS capacity and volume flow needs to be monitored to optimize the utilization of your existing CWS capacity.

If exceeding the CWS capacity, there will likely be delays in processing which could negatively impact coffee quality through:

- Coffee unpulped too long (>8 hours) post-harvest.
- Mixing of batches and overloading of fermentation tanks (leading to inconsistent fermentation).
- Overloading of drying beds (leading to inconsistently dried coffee).
- Poor quality control throughout the process (e.g., lack of appropriate sorting, labeling, and tracking).

If the CWS is too far below its operating capacity, the mill may experience the following:

- Wasted costs on labor and general operations (e.g., machine parts and maintenance).

OC 4 – Labor optimization: Though production will rise and fall over the course of the harvest season, the CWS manager is responsible for ensuring that the staffing levels (permanent and temporary) are relatively smooth and appropriate for the level of production at any given time. Temporary workers should be scaled up and down depending on coffee volumes. In total, operating costs of the coffee washing station should not exceed 20% of working capital needs (allowing for 80%+ in farmer payments).

9. SUSTAINABILITY GUIDELINES FOR COFFEE WASHING STATIONS

The following set of standards provides a framework for the implementation and monitoring of sustainable agronomic, social, environmental, and business practices at all levels of coffee production and processing.

RATIONALE

Sustainable coffee production requires efficient supply chains that support transparency and increase income and quality of life for coffee producers.

SUSTAINABLE COFFEE PRODUCTION

- Ensures decent wages and conditions for men and women producers, their families, and their employees, and promotes good relations with the surrounding community.
- Is climate smart and conserves natural resources including primary forests, water, soil, biodiversity, and energy.
- Promotes proper planning and implementation of practices that improve coffee quality, enterprise governance, and access to markets.

Standards are organized into three categories:

1. **Social Responsibility and Ethics (SRE)** – Encourages fair and ethical employment practices.
2. **Occupational Health and Safety (OHS)** – Promotes a safe working environment.
3. **Environmental Responsibility (ER)** – Promotes management of all resources and landscapes in coffee production and processing in a manner that protects the local environment, producers, workers, and the community.

9.1. SOCIAL RESPONSIBILITY AND ETHICS (SRE)

MINIMUM RECOMMENDED PRACTICES

SRE 1 – Child labor: All hired workers must be age 16 or over. Where national laws mandate a higher working age, this shall be recognized. Family labor during child’s free time will not be considered child labor unless it interferes with the child’s access to education. If minors (below 16 years) are employed, dangerous or physically excessive work is prohibited. All applicable national laws relating to the employment of minors must be observed.

SRE 2 – Gender Policy: CWS should develop and share a Gender Policy with all workers (in the local language and an easily understood format). Policy must include procedures to appoint a women’s representative and to increase levels of female participation in areas such as leadership, membership, and employment.

SRE 3 – Regular payment: Workers should receive regular payments daily, weekly, bi-weekly, or monthly, as mutually agreed prior to work commencing. Payments must be made in cash or agreed upon cash equivalent.

SRE 4 – Earnings records: Earnings records should be kept by management to include workers’ names, job type, hours worked, overtime hours, and wages (at a minimum). Workers should have access to their individual earnings records. Workers should sign or fingerprint the earnings records upon receipt of each payment.

9.2.OCCUPATIONAL HEALTH AND SAFETY (OHS)

MINIMUM RECOMMENDED PRACTICES

OHS 1 – Prohibited pesticides: Products included in sections 1A and 1B of the World Health Organization (WHO) Pesticide List or not legally registered for use in coffee should not be purchased, stored, or used. (Standard only applies to CWS purchasing, storing, or using pesticides.)

OHS 2 – Storage of pesticides: Pesticides should be stored in a manner that minimizes the risk to human health and the environment. The storage area should be kept locked with restricted access and warning signage. There should be adequate ventilation, a procedure to contain spills and a means of fire prevention.

Products should be stored in original containers and in a separate store from coffee and food. Store workers should receive pesticide safety training and be provided with – and required to use – Personal Protective Equipment (PPE). (Standard only applies to enterprise purchasing, storing, or using pesticides.)

OHS 3 – Personal Protective Equipment: Personal Protective Equipment (PPE) shall be provided for all applicable employees at no cost. Instruction on proper use and maintenance of PPE shall be given.

OHS 4 – Label all dangerous areas on the CWS site: Erect protective guards around moving parts, especially at the pulping machine.

9.3. ENVIRONMENTAL RESPONSIBILITY (ER)

MINIMUM RECOMMENDED PRACTICES

ER 1 – Wastewater management: The term “wastewater” refers to water that has been contaminated by any of the following: pulping cherry, fermentation, or mucilage removal; transport of parchment or pulp; washing and grading; soaking and cleaning the machinery or working areas.

Wastewater should be separated from pulp and managed as follows:

If untreated, wastewater should be contained in ponds at least 30 meters from any water body. If treated, water can only be released into water bodies after testing and compliance with national and/or international standards.

ER 2 – Coffee pulp management: Pulp should be converted into a productive by-product, for instance, compost for use as organic fertilizer by producers. The composting site should be protected from runoff and located at least 30 meters from any water body.

ER 3 – Soil erosion control: All slopes on the CWS property should have a combination of erosion-control methods including mulching/cover crops, shade trees, stabilizing grasses, terraces, contour planting, or physical barriers (as required).

ER 4 – Water protection: Buffer zones of at least three meters wide shall be maintained adjacent to all water bodies on the CWS property. A buffer zone should consist of vegetation – ideally indigenous – and not be cultivated.

ER 5 – General waste management: Waste must be properly sorted and disposed of without impact on the environment. Waste should be recycled, reused, or composted as appropriate. Waste that cannot be recycled, reused, or composted must be buried and not burnt. CWS grounds should be free from litter, and litter bins should be provided.

Annex A. Introduction to Rwanda INC Project

The Rwanda Ikawa Nziza Cyane (INC) project works to unlock the potential of Rwanda's coffee value chain by introducing innovative yet proven strategies and technologies to enhance the capabilities of coffee washing stations and other key actors. Partnering with government agencies, exporters, lenders, and other allies in the value chain, TechnoServe leverages its deep coffee expertise (agronomy, technology, market insights), and relationships to strengthen coffee supply chains across East Africa.

RWANDA INC'S MAIN ACTIVITIES ARE:

1. Equip coffee washing stations (CWS) with digital tools and platforms to enable better farm extension monitoring, business management insights, and deeper linkages with lenders, buyers, and government agencies.
 - Digital extension monitoring allows agronomists to measure and manage the adoption of best practices.
 - Business advisory and financial management dashboards to identify operational challenges and opportunities.
2. Expand access to critical inputs (e.g., fertilizer, lime and seedlings) through new distribution schemes.
 - Pilot new input distribution channels and incentive schemes through CWS.
 - Support an updated national strategy on agro-inputs to incorporate guidance on lime.
 - Support CWS and exporter access to working capital and other financial products.
3. Create new market research, quality standards, and policy recommendations to strengthen Rwanda's positioning as a preferred origin for specialty, African coffee.
 - Develop industry plans for differentiated coffee opportunities (e.g., certified, roasted, niche markets).
 - Co-create minimum quality and sustainability standards for Rwandan CWS
 - Enhance risk management abilities of exporters and lenders (e.g., collateral requirements, price risk).

Annex B: Procedure to Determine Percentage of Ripe Cherries

To evaluate ripeness percentage, spread the cherries onto the ground. Then, moving in one direction, classify all cherries as unripe, semi-ripe, ripe, or overripe. Also take note of foreign matter. This should be recorded; however, it does not count as a unit, therefore in total there will be 50 classified cherries plus foreign matter.

DEFINITION OF CLASSIFICATION CATEGORIES:

- Unripe: Coffee that is completely green
- Semi-ripe: Coffee that is both red (and yellow) and green (in any ratio of red to green)
- Ripe: Coffee that is 100 percent red (or yellow in case of a yellow bourbon coffee variety)
- Overripe: Coffee that is turning grey/black and has begun to wrinkle
- Foreign Matter (impurities): Anything that is not a coffee cherry

TO CALCULATE CLASSIFICATION PERCENTAGES:

Determine the percentage of each level of maturation. If using 50 cherries, this can be obtained by multiplying the quantity of each coffee maturation state by two. In the example shown in Figure 4, these percentages are as follows:

1. Unripe: $4 \times 2 = 8\%$
2. Semi-ripe: $15 \times 2 = 30\%$
3. Ripe: $26 \times 2 = 52\%$
4. Overripe: $5 \times 2 = 10\%$
5. Foreign Matter: 3 (note: this is not a %)

Figure 4. Fifty coffee cherries that have been classified according to maturation.



Annex C. Illustrative Producer/Receiving Log

Table 2. Producer/Receiving Log

Receiving Log	Receiving Lot Number	#	#	
ARRIVAL INFORMATION	Date			
	Time			
	Person Receiving			
	Person Delivering			
	Grower (G) & address (ID, Sector, Cell, Village, Phone number)			
	Stated Time Since Picking (hours or days)			
FARM INFO	Farm Name/Code			
	Farm Lot Information			
COFFEE INFORMATION	Weight (kg)			
	Total Container/bag Units			
	Stated Cultivar(s)			
QUALITY ANALYSIS	Unripe	%		
		Quantity (kg)		
	Semi-Ripe	%		
		Quantity (kg)		
	Ripe	%		
		Quantity (kg)		
	Overripe	%		
		Quantity (kg)		
	Foreign Matter (per 100 cherries)			
	Off Smell (Y/N)			
	Mold Present (Y/N)			
Sweepings (Y/N)				
Photo Taken (Y/N)				

Annex D: Coffee Processing Quality Index

COFFEE PROCESSING QUALITY INDEX (CPQI) FOR COFFEE WASHING STATIONS

The Coffee Processing Quality Index (CPQI) is a simple checklist to help coffee washing station (CWS) managers quickly and easily monitor key practices affecting coffee quality. The 18 items on the checklist cover four areas: (1) Cherry reception, (2) Processing and equipment maintenance, (3) Drying, and (4) Storage. This simple tool is currently used by coffee washing stations in Rwanda to help CWS managers, owners, and regulators to identify problems quickly and easily in real time for immediate course-correction.

How it works:

- The CWS manager makes a daily, visual inspection of the washing station and scores each of the 18 activities (see annex for full checklist) with a “Yes” (1) or “No” (0) depending on whether the activity is sufficiently performed.
- The daily score is calculated by adding up the score for each of the 18 activities (final scores can range from 0 to 18. Coffee washing stations should aim to achieve scores of “Yes” (1) on each item for best practices and to rectify any items that receive a “No” (0) prior to the next scoring.

Table 3. Coffee Processing Quality Index (CPQI) for Coffee Washing Stations. Primary User and Use-Case

PRIMARY USER	USE-CASE
CWS manager	Fill out the paper-based checklist (see template in Annex E) every day during CWS operations, sum the results, and review progress on each indicator daily.
Exporter or private mill owner	Review the CPQI checklist report regularly during the harvest season (weekly, or as needed) to assess the weekly score and any deficient areas to take corrective action.
Regulating body	Review the CPQI checklists during visits to (1) assess if CPQI checklist is used regularly, and (2) assess the average score over the course of the season

Annex D (Section 2): Coffee Processing Quality Index

Coffee Processing and Quality Index Checklist				
*This check is best performed during the afternoon when there is both drying and pulping activities going on				
Date :				
Coffee Washing Station Name :				
Filled by :				
SNO	Category	Criteria	Question	Checklist
1	Cherry reception	Quality cherry delivery	Look in the hopper and select 50 cherries at random. Are at least 90% (45 cherries) within the correct ripeness scale?	Yes/No
2	Cherry reception	Cherry weighing essentials	Look at a farmer weighing his cherry. Does the scale start at zero and is the name (or ID) of the farmer, date, volume and price filled out on the receipt?	Yes/No
3	Cherry reception	Cherry sorting	Look at the cherry before it is fed into the pulp hopper. Are they sorted by color or density before going into the pulping machine?	Yes/No
4	Pulping	Timely cherry pulping	Cherry should be processed within 8 hours of harvesting. Select a few farmers and ask when was the cherry harvested. Was it less than 8 hours ago?	Yes/No
5	Pulping	Water source cleanliness	Look at the water source. Is all water used visibly clean with no debris and no ponds leaking or overflowing?	Yes/No
6	Pulping	Machine cleanliness	Look at the pulping machine. Is it working well, adjusted correctly and clean with no leftover debris?	Yes/No
7	Pulping	Machine calibration	Look in the fermentation tank and select 50 beans at random. Are no more than 10 beans cracked, un-pulped or damaged?	Yes/No
8	Fermentation	Fermentation tank cleanliness	Look for old cherry pulp and parchment in the fermentation tank. Is the fermentation tank appropriately cleaned after the removal of the last batch?	Yes/No
9	Mucilage removal	Fermentation monitoring	Look at the fermentation area. Is someone checking the almost-fermented wet parchment every hour?	Yes/No

Coffee Processing and Quality Index Checklist

10	Washing	Washing channel cleanliness	Look for old cherry pulp and parchment in the washing channels. Are the washing channels appropriately cleaned after the removal of the last batch?	Yes/No
11	Washing	Washing monitoring	Look at the parchment at the end of grading channel or just transferred to skin drying table. Is there any mucilage left on the beans?	Yes/No
12	Drying	Parchment sorting	Look at the parchment coffee on the skin drying and drying tables. Are the beans being sorted (removing defective beans), rotated (turning the coffee) and labeled by grade?	Yes/No
13	Drying	Drying table bean depth	Look at the parchment coffee on the drying tables. Are the beans less than 5cm deep (approximately 1/2 your index finger)?	Yes/No
14	Drying	Drying table flatness	Look at the drying tables. Are most tables at the washing station flat with no sagging?	Yes/No
15	Drying	Covering coffee	Look if all drying tables have plastic sheets (nylex) and shade nets. Is the parchment covered with shade net during hottest part of the day (11am-2pm) and with plastic sheet (nylex) during rain and at night?	Yes/No
16	Drying	Bean moisture measurement	Look at a sample of parchment in the coffee store and check the moisture level. Is it at 10-12% moisture?	Yes/No
17	Storage	Store cleanliness	Look at the parchment store. Is the coffee store dry, clean and free of pests? Is the coffee elevated off of the floor and well ventilated?	Yes/No
18	Storage	Orderly store registry	Look at the parchment store register and labels. Is the coffee sorted and labeled by grade?	Yes/No

Scoring system: Yes=1 & No=0	Total score	
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Comments

Annex E: Sustainability Standards for Coffee Washing Stations

SUSTAINABILITY STANDARDS FOR COFFEE WASHING STATIONS

The sustainability standards include key indicators to assess a coffee washing station’s social and environmental performance during the processing season. The categories include:

- Social responsibility and ethics
- Occupational health and safety
- Environmental responsibility

How it works:

- The CWS manager should be trained in the definition and importance of each of the sustainability standards.
- The CWS manager is ultimately responsible for the compliance of the CWS to each of the standards and should perform regular assessments during the processing season. For those areas found to be non-compliant, the CWS manager should work with relevant personnel to create a plan and resolve the issue in a timely manner.

Table 4. Sustainability Standards for Coffee Washing Stations Primary User and Use-Case

PRIMARY USER	USE-CASE
CWS manager	<ul style="list-style-type: none">● Perform regular assessments (e.g. weekly) using the sustainability checklist.● For areas found to be non-compliant, the CWS manager should work with relevant personnel to create a plan and resolve the issue in a timely manner.
Exporter or private mill owner	<ul style="list-style-type: none">● Review the results of sustainability audits and action plans each month.
Regulating body	<ul style="list-style-type: none">● Review the sustainability audits during visits to (1) assess if audits are conducted regularly and (2) assess the continuation.

Annex E (Section 2): Sustainability Standards for Coffee Washing Stations

COFFEE PROCESSING SUSTAINABILITY INDEX - CPSI

CWS Name:

Date:

Time of Day:

Evaluator:

NB. This check is best performed during the afternoon when there is both drying and pulping activities going on

	Statement	Score	Comments
	Social and environmental standards		
1	On coffee washing station site no waste water is emitted to natural streams or ground. The channels transporting the water or evaporation ponds or wetland do not overflow. <i>Check for signs of recent overflow around channels and ponds</i>	Yes/No	
2	There is no visible sign of unnecessary water spillage <i>Check for any unnecessary spillage (eg. running taps/broken pipes); specifically check water tank, pulping, fermentation and grading channel areas.</i>	Yes/No	
3	Coffee pulp separated from wastewater and stored separately <i>Check if there is a system to separate pulp from wastewater in place (eg. pulphopper or filter in channel)</i>	Yes/No	
4	The moving parts of the pulper are shielded off by guards; the evaporation ponds are fenced off; no sharp materials are lying around; and workers are not exposed to any danger. <i>Check machine area</i>	Yes/No	
5	Workers on site are working under good working conditions meaning they have access to potable water as well as sanitary and hand-washing facilities <i>Ask workers about working conditions and check whether toilet, handwashing and drinking water is available</i>	Yes/No	
6	There is not a single underaged worker (<16 yrs) on site	Yes/No	
	Bookkeeping and Financial Management		
7	All coffee washing station income and expenses are recorded in designated books (paper or digital) and receipts issued for each (preferably a carbon copy kept for filing). <i>Check whether a proper accounting system is in place and being used</i>	Yes/No	
8	Cashflow is managed effectively so that the coffee washing station does not need to stop cherry purchases and any on credit delivered cherries are paid out to farmers within the agreed period. Equally, coffee washing station workers are paid within the agreed period. <i>Check whether any collection sites were forced to stopped buying over lack of liquidity and whether cherry purchases on credit and workers' wages are paid within agreed upon</i>	Yes/No	
	Total score		

CPSI scoring

Yes=1 & No=0

Annex F: Optional Checklists for CWS Operations Management

CHERRY RECEPTION (CHECK AS APPROPRIATE)

- Selective picking of only dark red ripe cherries
- Cherry delivered to CWS within 8 hours of harvesting
- Cherry bags visibly clean
- Quality check performed on cherries by collection agent
- Cherry sorting done
- Foreign materials removed (stones, twigs, leaves, and other crops)
- Cherry hopper clean and free from any previous harvest cherries
- Cherries in the hopper within acceptable color range
- Receipt issued for receipt of cherries

PULPING (CHECK AS APPROPRIATE)

Daily: Before pulping

- Clean water used for pulping

Daily: During pulping

- Check parchment coming from the machine is unbroken and pulp is well-separated from parchment
- Pulped coffee separated by density and size
- Pulped coffee of different grades separated and in different fermentation tanks
- Clean the machine with plenty of water and remove any remaining coffee bean or pulp and sugars from last pulping
- Pulping water recirculated not more than 3 times and checked for cleanliness

Daily: After pulping

- Clean the drainage and coffee channels
- Check the slots are in place before next pulping
- Check the pulleys and all belts for slackness
- Check water pipes connected to machine for leaks
- Check settings of chops before next pulping
- Pulping machine rinsed before pulping

Weekly

- Clean machine and machine house thoroughly (sugars stain the machine/machine area) and let machine house dry
- Grease all bearing/moving points (including the pre-grader) using only white grease
- Check chops and knives settings
- Check pre-grading tank for leaks and repair if needed
- Check sieves on pre-grader and conveyor channels for breakages or sharp surfaces that could break beans
- Check disc movement, speed, and direction; disc should rotate forward at uniform speed (if the disc is loose or wobbling it is wrongly placed)

During season

- Pulper calibrated with harvest progression: (1) start of season (tighter calibration due to smaller bean size), (2) start of the middle of season (looser calibration due to larger bean size), (3) start of season end (tighter calibration due to smaller bean size)
 - In addition, whenever the output is not optimal, the pulper should be calibrated so there is a clear separation between pulp and beans – beans do not break or become nipped (appear white on the skin drying table)
- If operating on diesel or petrol engine, make routine oil and filter change per manufacturer's recommendations

End of season

- Pulper serviced and/or repaired
- Checking all bearings and replacing worn out bearings
- Check discs and replace worn out discs
- Check the surfaces of all the discs, if smooth, then remove and get the discs sprayed (the surface of the discs should be rough to pulp efficiently; there are special workshops that spray the discs)
- Repair machine hopper if slots are worn out
- Check pulleys and replace worn out pulley links
- Remove fuel and oil from engine/generator and clean
- Using a sponge or soft cloth apply coconut oil or edible oil on all metal surfaces including chops and knives of machine to preserve against rust
- Store clean and repaired pulper in a secure storage location and cover with sheet

FERMENTATION (CHECK AS APPROPRIATE)

- Fermentation tanks smooth, repaired, and painted/tiled
- Fermentation tanks marked with parchment grades
- Fermentation tanks clean prior to parchment reception
- All water drained off to allow dry fermentation
- Extra pulp and floaters on parchment 1 and 2 removed
- Fermentation time monitored – start/stop – 16-36 hours depending on weather
- Parchment physically checked regularly to avoid over fermentation
- A gritty sound is produced upon rubbing the coffee on your hands
- Mucilage on parchment surface washes away easily
- Fermentation tanks have roof protection against rains and tanks covered with sheet at night to regulate temperature

WASHING (CHECK AS APPROPRIATE)

- Washing channel smooth, repaired, and painted/tiled
- Washing channel clean prior to parchment reception
- Clean water used to wash coffee
- Workers use clean hands, feet/gum boots, and are well trained
- Adequate water flow to wash and grade coffee
- Stopper wood planks used to control floating/flow of beans along channel
- Washing done upstream in a stirring fashion, rubbing against each other and the floor, moving light beans downstream
- Squeegees used to wash coffee are not worn out and bruising the beans
- Parchment surface clean and free of mucilage before drying
- Washing water visibly clean before parchment removal for drying

DRYING (CHECK AS APPROPRIATE)

- Drying tables flat and mesh wire is straightened
- Shade nets and Nylex in good condition (not torn)
- Coffee at skin drying spread thin (+/-5cm), dry within 8 hours from washing
- Coffee on skin drying tables hand-picked for defects directly after washing so parchment still wet
- Coffee, when moved to drying tables, is separated by grades and drying stage
- Coffee labeled on drying tables
- Coffee on drying tables turned continuously, each 2 hours
- Coffee depth on tables not more than 5 cm or 3 inches
- Bean temperature is monitored (by infrared meter or feeling by hands) not to exceed 35 degrees Celsius
- Coffee partially covered with shade netting during peak overhead sun hours

- Coffee covered overnight and during rains
- Moisture readings are taken at the same time daily
- Coffee is dried to 10-12% moisture content before movement to store

BAGGING, STORAGE AND TRANSPORTATION (CHECK AS APPROPRIATE)

- Properly dried coffee is moved into store
- Coffee stored in clean bags
- If reusing the bags, previous parchment removed from the bags
- Coffee bags in store weighed, sealed, and labeled
- Store is clean, pest, and rodent free
- Store is leak proof
- Store is well ventilated
- Store used exclusively for coffee (no agrochemicals, fuels, other crops)
- Coffee stacked on wooden pallets
- Pallets raised 15 cm from the floor and 30 cm from the walls and roof
- Coffee in store rotated on first-in-first-out basis
- Coffee in store separated by lots and grades (label or bag writing must include day of pulping and grade)
- Transportation to dry mill during the day
- Truck is clean, closed, and leak proof
- Truck in good condition – new tires, engine function, and experienced driver