

# Documentation of the CALIDENA Kick-off for mango in Accra, Ghana

Strengthening of the quality infrastructure system to increase the competitiveness of agricultural export products



## Technical Cooperation with Ghana Standards Authority (GSA)

Country | region: Ghana

City | country: Accra, Ghana

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## Abbreviations

<b>ARSO</b>	African Standards Organization
<b>BRC</b>	British Retail Consortium
<b>CAC</b>	Codex Alimentarius Commission
<b>DakKS</b>	Deutsche Akkreditierungsstelle GmbH
<b>EPA</b>	Environmental Protection Authority
<b>EU</b>	European Union
<b>FDA</b>	Food and Drug Authority
<b>FSSC</b>	Food Safety System Certification
<b>GAP</b>	Good Agriculture Practices
<b>GIZ</b>	Gesellschaft für Internationale Zusammenarbeit
<b>GS</b>	Ghana Standard
<b>HACCP</b>	Hazard Analysis and Critical Control Points
<b>IFS</b>	International Food Standard
<b>ISO</b>	International Organization for Standardization
<b>MOFA</b>	Ministry of Food and Agriculture
<b>MOTI</b>	Ministry of Trade and Industry
<b>MRL</b>	Minimum Residue Level
<b>NFS</b>	Company name
<b>NQI</b>	National Quality Infrastructure
<b>PPRSD</b>	Plant Protection and Regulatory Services Directorate
<b>PTB</b>	Physikalisch-Technische Bundesanstalt
<b>QI</b>	Quality Infrastructure
<b>SANAS</b>	South African National Accreditation System
<b>SGS</b>	Company (International Certifier) name
<b>SMCD</b>	Supreme Military Council Decree
<b>SPS</b>	Sanitary and Phytosanitary
<b>TR</b>	Technical Regulation
<b>UK</b>	United Kingdom
<b>UKAS</b>	United Kingdom Accreditation Service
<b>VC</b>	Value Chain

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## 1. Objective of the CALIDENA kick-off

Participatory assessment of quality requirements for the export of mangos and mango-based products from Ghana, identification of gaps in quality infrastructure (QI) and conformity assessment and elaboration of joint action plan to improve the quality management and quality services for the whole export value chain (VC).

The general aim of a CALIDENA exercise is:

- to enhance awareness about quality and food safety issues,
- foster the demand of quality services within selected VCs and
- strengthen the demand-orientation of QI in the country.

## 2. Agenda of the workshop

Time	Tuesday, 24-OCT	Wednesday, 25-OCT	Thursday, 26-OCT
	<i>Workshop-day</i>	<i>Field-trip-day</i>	<i>Workshop-day</i>
9:00	Opening	Meeting at GSA (Accra) and travel to mango processing plant	Golden Thread: Refreshing learning from the days before with the quality quiz
	Clarifying the concepts	Visit of fruit processing plant - HPW Fresh & Dry	Identification of “hot topics” and possible solutions for quality in the mango VC
	Mapping of stakeholders and the value chain		Visit of the GSA Pesticide Residue Laboratory
	Interview with international buyer		
13:00	Lunch break	Lunch break	Lunch break
14:00	Identification of different markets and buyers for mango products	Visit of mango farm and Yilo Krobo Mango Farmers' Association	Preparation of action plan for improving the chain's internal interaction as well as quality assurance services
	Inventory of standards and technical regulations and standards research	Visit of pack house	Steering structure and follow-up
	Evaluation of the day	Travel back to GSA (Accra)	Evaluation of the training
16:00	End of the day	End of the day	End of the workshop

## 3. Results of the workshop

### 3.1 Day 1 – Workshop opening and setting the grounds

#### a) Opening

After the opening prayer spoken by Reverend Lawrence Lomo Kwami, PTB Project Coordinator, Carola Heider, introduced the longstanding collaboration between PTB and GSA and informed the participants about the running PTB project. She highlighted that the CALIDENA process for the mango value chain is an important part of the project and that PTB would support selected activities as defined by the participants at the end of the workshop.

The consultant and facilitator, Katharina Telfser, shortly introduced the agenda and objective of the workshop, then the participants were invited to assess the potential of the mango value chain answering the question “How does the future of mangoes from Ghana look?” by placing a dot on a thermometer. Overall, the participants perceived the potential of mango as very high. In a short discussion, the participants highlighted some aspects supporting the optimistic view and other points referring to the challenges the mango sector is facing:

Very positive	Cottage industries need to understand standards
Positive *	No holistic approach
Farmers are ready	Mango farmers with business mindset
Local market grows	No synergy with and between support organizations
Mango market is huge	Challenge working together
Support activities started	Duplications
Farmers with good practices	Lack of need assessment
Opportunities in processing?	NGOs go to farmers directly → more coordination needed MOFA/MOTI
Testing quality	Development cooperation tries to coordination efforts

After a round of personal introduction (see participant list in annex A), the group defined an agreement of collaboration for the workshop, including the following rules: interaction, punctuality, active contribution, openness, listening and respecting other / different viewpoints, mobile phones silent, be clear about expectations, honesty.

## b) Clarifying the concepts – value chain and quality infrastructure

Next, the workshop facilitators explained the main concepts that would be the topic of interest during the three workshop days: value chain and quality infrastructure.

*Value chain* describes the complete range of activities carried out by companies taking the product from its creation to its end use and beyond. This process includes materials, production and distribution and it usually involves several companies and supporting institutions. The value chain begins with the client’s requirements and analyses the interrelationship back along the chain. The value chain is thus characterised by the product moving from the raw material towards the end user, while information about the expectations and requirements of the buyer or end user is flowing in the opposite direction. Furthermore, it is important that there is traceability in a value chain, i.e. that a product and its ingredients can be traced back throughout the value chain to the raw material.

*Quality infrastructure* encompasses all the institutions that provide services for quality assurance which enable compliance with existing regulations and knowledge and application of the quality requirements of specific markets. A complete national quality infrastructure is made up of the standards body, the national metrology institute, calibration laboratories, testing laboratories, certification and inspection bodies, and the accreditation body. To achieve international recognition for their services, the national bodies need to establish relations to the international and regional quality infrastructure systems. For example, the national standards body should be collaborating with the International Organization for Standardization (ISO) and the African Organisation for Standardisation (ARSO). Quality infrastructure services are relevant for each step of the value chain. The graph below provides a visual overview.

## Quality Infrastructure & Value Chains



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### c) Mapping of stakeholders and the value chain

Then, the workshop participants gathered in groups according to their role in the value chain. To complete the stakeholder mapping, they identified additional actors in their respective part of the value chain, who were not present but might be included in activities resulting from the workshop.

#### *Mango farming:*

Present: Seth Djanmah, Reverend Lawrence Lomo Kwami, William Kpesese, Daniel Doku, Davies Korboe

Additional: Mango farmers from other regions, input dealers, seedling producers, transporters, aggregators

#### *Mango processing:*

Present: Gloria Teye (Doku Farm mango chips), Daniel Komayire (HPW Fresh & Dry), Vida Ofori (Bomarts)

Additional: Blueskies, ITFC, WAD, small juice processors, Peelco, Sunfruits, Quin Organics, Caprisun

*Retail / Export:*

Present: Gaudenz Pfranger (HPW AG Switzerland)

Additional: Peelco, Bomarts, Evelyn Farms (Basam), Blueskies, small retailers, Vegpro, Sunripes

*Support organizations:*

Present: Ernest Adu Dwumfour (AfriCert Ltd), Richard Nyumuah (AFC/GIZ), Moussa Coulibaly (Global GAP Trainer), Meinster Kodjo Eduafo (GSA), Alex Kwapong (Ministry of Trade), Nathaniel Brakoh (GSA), Anthea Ohene (NBSSI), Paul Date (GSA), Dr. Charlotte Oduro-Yeboah (CSIR – Food Research Institute), Paul Mintah (Crop Research Institute), Erasmus Ashun (GEPA), Victor Mensah (GAPS Consult), Lysbeth Adetola (Leadership Solutions), Adi Okutu (PPRSD), Carola Heider (PTB), Christina Foerg-Wimmer (PTB consultant)

Finally, the representatives of each group, in collaboration with the representatives of the support organisations identified the most important activities in each phase of the value chain from mango farming, over processing, to retail and export (see complete tables on pp. 9-10).

**d) Interview with an international buyer**

HPW Switzerland is a retailer with focus on sustainable business and fair trade. The company sees itself as the bridge between farmers and the market. From Ghana, HPW sources dry fruit (HPW Fresh & Dry) and fresh cut fruit (Blueskies).

Among European consumers a clear trend towards healthy food and organic produce is showing. For the European market quality and traceability are key. Retailers are very powerful.

HPW is aware that it is a great challenge to produce perfectly looking fruit with minimal or no pesticide use. Especially Bacteria Blackspot disease (BBS) is a big challenge that cannot be controlled without pesticides. To handle the disease effectively, all farmers need to be committed and the quality of pesticides used needs to be assured. Due to its humid climate, Ghana has a disadvantage compared to other mango producing countries in the region.

Logistics and shelf life also pose challenges for fresh fruit, as HPW prefers shipment by sea rather than air, to keep the transport as sustainable as possible.

**e) Identification of different markets and buyers for mango products**

The group shortly discussed different markets and buyers for mangoes.

Fresh mango	Processed mango
UK / EU (through Netherlands)	Local market (HPW)
Lebanon / Middle East	UK / EU / Switzerland

**f) Inventory of standards and technical regulations and standard research**

The relevant standards and technical regulations in the EU and in Ghana were identified by the workshop participants. The workshop facilitators highlighted the difference between technical regulations which are mandatory and ensure the safety of the product, and standards, which are voluntary. Here a differentiation between formal standards developed in the context of ISO and private standards, developed by private associations or organizations can be made. Both types of standards may be necessary to gain market access.

**Market: Europe**

	Technical regulation	Formal standard	Private standard
Fresh mango	EU organic EU packaging Food safety regulation	HACCP / Codex	Global GAP BRC Fair Trade
Processed mango	EU organic EU packaging	ISO 22000	FSSC Fair Trade IFS BRC

**Market: Ghana**

	Technical regulation	Formal standard
Fresh mango	Biosafety Act, 2011 Plants and Fertilizer Act, 2010, Act 803 Codex Stan 53-2003: code of hygiene practice for fresh fruit Water Resources Commission Act, 1996, Act 522 Environmental Protection Agency Act, 1994, Act 490: pesticide control and management Food and Drugs Act 1992, PNDCL 3058 Irrigation Development Authority Act, 1977, SMCD 85: water management, health and safety	Green label (mainly for vegetables; compatibility with mango to be assessed) GS 546: Fresh fruit GS 967: Planting materials GS IM 10: Inspection of mango planting material GS 1066: Code of hygiene for fresh fruits
Processed mango		GS 1037: dried mango GS 1125: mango processing Fruit juice GS CODEX STAN 160: Mango chutney

No private standards were identified for the Ghanaian market.

Information about EU regulations is available from the website of the EU Trade Help Desk <http://trade.ec.europa.eu/tradehelp/> and information about private standards can be found at [www.standardsmap.org](http://www.standardsmap.org).

Moreover, the GSA Library is an important hub for information about requirements in export markets. The workshop participants visited the library, which is located on the second floor of the main building. The staff informed the visitors that Ghana Standards can be viewed and purchased at the library. The competent library staff is happy to support visitors in their research. In its function as TBT inquiry point, the library can also contact inquiry points in potential export markets to gather information about country-specific requirements.

The participants divided into groups and conducted research on selected standards to identify relevant requirements for the different value chain links (see tables below). This task was perceived as challenging as standard documents and technical regulations are not easily understandable and often refer to further regulations, standards, or other documents.



*Mango farming*

VC Activities	Standard / TR requirement
Land acquisition	Free of marked bruising Free of black necrotic stains Practically free of damage caused by pests Free of abnormal external moisture The mangoes must be whole, firm, fresh in appearance, clean, free of damage by low temperature Global GAP: Compliance criteria: calibration of equipment Site management Soil management Preharvest water quality Application of organic fertilizer from animal origin Harvesting and post-harvest processes (sanitary facilities etc.) Packing and storage Pest control
Land preparation	
Planting material	
Planting	
Crop management	
Certification	
Marketing	

*Processing*

VC Activities	Standard / TR requirement
Receiving fruit from certified suppliers	Global GAP: Compliance criteria; calibration of equipment Sanitary facilities Site management Water quality Packaging and Storage Temperature and humidity control Pest control Post-harvest washing Post-harvest treatment
Quality control checks on raw materials	
Washing and sorting	
Stocking and ripening	
Peeling and cutting	
Extraction of juice / drying of fruits	
Packaging	
Storage	

*Retail and export*

VC Activities	Standard / TR requirement
Market (identification of requirements)	Compliance with microbiological criteria Compliance with temperature control requirements Maintenance of the cold chain Sampling and analysis Put in place, implement and maintain HACCP system Official controls, registration and approval: phytosanitary certification
Sources of supply	

Inspection / certification (products & systems)	pesticide analysis
Laboratory / testing	Global GAP: Packaging and storage Hygiene Temperature and humidity control Pest control
Logistics / packing	Post-harvest washing Compliance criteria
Export documents	Uniformity Packaging Description of contaminants Marking and labelling

### g) Evaluation of the day

The participants evaluated the first workshop day based on content, methodology and group spirit. The results were the following:

- Content: 17 positive; 6 indifferent
- Methodology: 19 positive; 1 indifferent
- Group spirit: 18 positive, 4 indifferent.

## 3.2 Day 2 – Field trip

The second workshop day was dedicated to gaining first hand insights into the different value chain links. The participants visited a fruit processing plant, a mango plantation and farmers' association and a pack house. At each site, they had the chance to ask questions to better understand the concrete activities and identify quality gaps.

### h) Visit of fruit processing plant – HPW Fresh & Dry

The CEO Maik Blaser welcomed the group at HPW Fresh & Dry and shortly presented the company. At the factory, mangoes, pineapples and coco are dried, mango being the most important product. Fresh mango is not seen as a viable product for Ghana, as the humid weather conditions increase pest issues. The company is BRC certified by NFS since 2011. HPW Fresh & Dry does not require its farmers to be Global GAP certified, as the certification is challenging for many farmers and requiring certification would cause supply issues. The company has its own supplier management system in place to assure correct farming methods and quality of supply. A major problem is the short supply window that is limited to two mango seasons per year. A diversification of varieties from the currently cultivated Keitt and Kent would allow to expand the supply window. The company is therefore encouraging farmers to diversify the cultivated varieties. Pesticide residue levels have not posed issues so far. Testing is usually carried out by SGS and sometimes by GSA. However, with GSA long delays in receiving testing results have been experienced.

More information about HPW Fresh & Dry can be found in the presentation in annex B and on the company website: <http://www.hpwaq.ch/en/home/>

#### **i) Visit of mango farm and Yilo Krobo Mango Farmers' Association**

The Yilo Krobo Mango Farmers' Association led by Reverend Lawrence Lomo Kwami welcomed the workshop participants on one of their farms. The farmers gave a short introduction, mentioning that they had set up the association with the intention to send fresh produce to export. Currently the farmers' association is selling mainly to Blueskies, which is producing fresh cut mangoes. The majority of the farmers in the association are Global GAP certified as a group, as the certification is required for fresh mangoes. The group certification allows them to lower the costs of certification. To comply with Global GAP, the farmers are for instance required to keep records of their farm management, have save storing facilities for chemicals and washing facilities on the farm. Global GAP certification is offered by several certification bodies including Africert, Ecocert and Bureau Veritas. Organic production is currently not an option.

The farmers are particularly worried about sub-standard quality produce delivered by a few farmers, which might trigger an import ban to the EU and reduce the market to countries in the Middle East. Moreover, the quality of available agrochemicals was questioned by the farmers. They were encouraged by Adi Okutu to inform PPRSD when they suspect that substandard products are being sold to them, so that specific market surveillance measures can be taken.

#### **j) Visit of pack house**

As last stop, the group visited a pack house in the Somanya region that is being used by several farmers' associations. As the visit was carried out between the two mango seasons, the facilities were currently not in use. The two guides let the participants from the arrival of the fruit along the equipment for sorting, washing, fungicide application and waxing to the packing stations, cool rooms and loading area. Regular calibration of the equipment was identified as an opportunity for improvement.

### **3.3 Day 3**

Day 3 started with a quiz during which participants had to explain the meaning of terms that are important in the context of CALIDENA. The terms and definitions can be found in the glossary of the CALIDENA handbook (part of the folder handed out to the participants).

#### **k) Identification of hot topics and possible solutions for quality in the mango value chain**

Using the insights gained during the field trip, the participants identified quality-related gaps for each link of the value chain and defined possible solutions. The results were added to the previously elaborated overview of the value chain and quality requirements identified in standards and regulations. The outcome of the exercise is summarised in the following tables:

### Mango farming

QI component	Current situation	Gaps	Proposals
Quality system / good practice	QMS is in place for all farmers	No added incentive for using QMS	Farmer organizations negotiate with buyer for premium price A national policy ensures that all farmers put in place the minimum QMS e.g. Green Label
Standards & TR	Are in place	Fares are aware of standards and TR but do not really consider their importance	Enforcement of standards and TR Pictorial dissemination of standards on mango (some exist already!)
Conformity assessment	Exists	Few conformity assessment bodies exist Capacity to test new substances Delivery time is slow No seed certification Reliability of lab testing	National quality infrastructure should be put in place Improve upon delivery times for services Encourage group certification Put in place an effective conformity assessment scheme to check imports
Metrology	Is in place	Capacity is now being built for moisture calibration Calibration for use of pesticides Information about metrology for farmers	Inform farmers better about metrology
Accreditation	Is in place	Not aware about quality	Accreditation

### Processing

QI component	Current situation	Gaps	Proposals
Quality system / good practice	QMS is in place	Dependency on certified suppliers. Not all are certified.	Conformity system for farmers who are not certified.
Standards & TR	EU packaging? GS 1037? BRC, Fair trade FDA – factory office and shop act (1970)	Organic requirements are not met.	
Conformity assessment & Metrology	Microbial tests Weights MRL → per batch GSA, SGS, Food Research	Clients doubt reliability of results. Guidelines for sampling missing. Efficiency of testing lab (takes long time)	Proficiency testing between labs. GSA to issue guideline & handout to farmers and other clients. Improve efficiency of services at GSA.

	Certifier: MNF	Weighing scales → no stickers. Cooling chain? Samples are tested only once. Information flow is inadequate between lab and client.	GSA should expand its scope of analysis. Establish information flow on inefficient chemicals for EPA to take action. EPA to establish adequate post market surveillance on chemicals. Involve EPA regarding pesticide issue.
Accreditation	SANAS, DakS, UKAS	No accreditation body in Ghana	Establish accreditation body in Ghana – also for the region

### Retail and export

QI component	Current situation	Gaps	Proposals
Quality system / good practice	Draft HACCP plan Cold rooms	No HACCP certification Temperature control Cold storage during transport Pest control Poor drainage system	HACCP certification Maintain cold storage during storage and transport Pest control system Improve drainage
Standards & TR	Certified Global GAP No TR (FDA, EPA etc.)	FDA license	Obtain license from FDA EPA/GSA monitor quality of pesticide on the market ISO 22000, IFS, BRC
Conformity assessment	FDA inspected MRL testing Global GAP certified	No internal lab	Establish internal lab Information flow on trends of contamination between stakeholders of VC Train farmers on sampling for lab analysis
Metrology	Weights and Measures are done	Equipment is not calibrated	Liaise with GSA for calibration
Accreditation			

### I) Visit of the GSA Pesticide Residue Laboratory

The workshop participants were also invited to visit the Pesticide Residue Laboratory of GSA. The laboratory staff Ernestina Adeenze guided the visitors through the laboratory, starting at the sample reception and passing through the sample preparation and storage area to the rooms where analysis are carried out. Ernestina Adeenze explained the different types of equipment that are used. At this moment, 36 pesticide types can be tested.

Some participants raised doubts about the reliability of testing results. Ernestina explained that tests are repeated if unexpected testing results are achieved, so that a mistake in the testing

process can be excluded. Clients are welcome to contact the laboratory and make an appointment to discuss the results, so that doubts can be clarified.

**m) Preparation of the action plan**

Finally, the workshop participants, defined concrete activities that can be brought forward by the people present, focusing on the identification of “quick wins.” The defined action plan with champions for each action is reported in annex C.

**n) Steering structure and follow-up**

For the steering of the CALIDENA activities and the follow-up a steering group was defined. It is made up of Reverend Lawrence Lomo Kwami, Richard Nyumuah, Daniel Komayire, Paul Date, Christina Förg-Wimmer, Katharina Telfser and Frederick Mills.

Moreover, the CALIDENA activities will be presented and pursued in the frame of the Mango Round Table. Richard Nyumuah is in charge of including the CALIDENA action plan in the agenda of the next round table. Daniel Komayire will be the spokesperson of the CALIDENA team within the Mango Round Table.

**o) Closing remarks and prayer**

To close the workshop Prof. Alex Dodoo, Director General of GSA and Paul Date, Head of Scientific Metrology at GSA highlighted the importance of quality to strengthen Ghana’s export and economy at large. Prof. Dodoo confirmed that GSA is here to support farmers and industry actors to succeed on national and international markets. The CALIDENA methodology is an important tool to bring stakeholders together and collaborate to solve quality issues in promising value chains.

Also, Carola Heider thanked the workshop participants, GSA and the organization team. Reverend Lawrence Lomo Kwami spoke the closing prayer.

**p) Workshop evaluation**

Categories	1	2	3	4	5	6	Comments
Preparation/ Advance Information			3	2	9	6	Very good.
Working method				2	8	10	Very good.
Subjects of the meeting			1	1	7	10	Very good.
Moderation				3	10	7	Very good.
Group Dynamics				3	8	9	Very good.
Benefit for your work				3	10	7	Very good.
Satisfaction of your expectations			1	2	10	7	Very satisfied. Great, learnt new things. Very well satisfied.
Organisation, logistics, venue			1	2	9	8	Very good.
Time schedule		1		3	6	10	
Accommodation (if applicable)				2	1	6	
Meeting Room			2	3	6	9	
Meals			3	3	6	7	
Do you want to continue this kind of exchange on a Directors level; if yes, which topics would you like to address in these meetings?							Quality issues.
Other comments							Real issues are beyond 3 months' plan. Very impressed with PTB. Concerns of other processors who have been invited must be used, as focus was on only one processor.

1 = very bad; 2 = bad; 3 = average; 4 = good; 5 = very good; 6 = excellent

**Annex A: Participant list**

**Annex B: Presentation HPW Fresh & Dry**

**Annex C: Action plan**