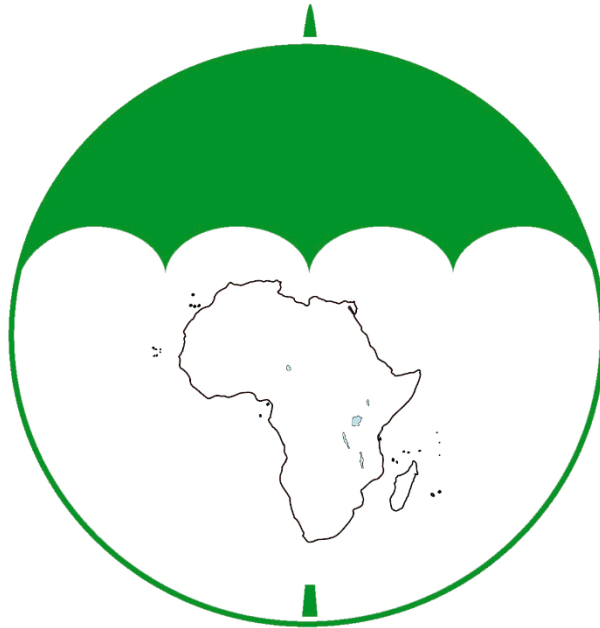


Terms of Reference



CONTRACTING ORGANIZATION	AFRICAN ORGANISATION FOR STANDARDISATION P. O. Box 57363 - 00200, NAROB, KENYA 3rd Floor, International House, Mama Ngina Street Tel: +254 20 2224561/311608 E-mail: arso@arso-organ.org
CONSULTANCY TERMS OF REFERENCE	DEVELOPMENT OF VALUE ADDITION MODULES
CONSULTANT	
	P. O. Box
	Tel:
	Email:
	Duration:
	Total Pay: To be Part of Financial Proposal

ARSO Central Secretariat
Nairobi, Kenya
September 2022

Terms of Reference for Development of Value Addition Modules

1. Background

One of the greatest unresolved challenges facing Africa's agribusiness sector is the lack of value addition. Most African agricultural products are exported raw to global markets, and the processing industries that do exist locally struggle to add value (GTR, 2019). For instance, a significant number of agricultural products are sold direct as fresh produce as in the case of cut flowers and some fruits and vegetables. However, most fresh fruits and vegetables are only edible for a very short time and will rot unless they are promptly and properly preserved. Processing of fruits and vegetables is very important to produce products for direct consumption and as food ingredients. The major challenges posed by fruit and vegetable processing are related to the agricultural practices in the production of fruits and vegetables, the utilization of fruits and vegetables for their functional properties, mild preservation and/or minimal processing technologies, safety assurance during processing, retail and distribution practices, maintenance and/or monitoring of quality, and shelf-life improvement (Barrett *et al.*, 2005; Hui & Evranuz, 2016; Siddiq & Uebersax, 2018; Sinha *et al.*, 2012). During processing, the main objectives are to preserve the colour, flavour, texture, and nutrition while prolonging the shelf life of perishable fruits and vegetables (Sumonsiri & Barringer, 2014). Fruit and vegetable processing can be as basic as grading, washing, cooling, peeling, blanching, size reduction, freezing, dehydration, canning, minimal processing, and sustainability. African exports of horticultural and processed agricultural products are growing in line with the major shift towards these products in world markets (Emiko & Will, 2016). Continued growth in these exports may be vitally important for expanding returns from African agriculture and for increasing its overall exports. Agricultural exports from Africa include a much larger share of bulk agricultural exports than is the norm on world markets where processed products have come to dominate. This calls for a re-orientation toward exporting value added horticultural products which is the current drive in many other developing and developed countries. For example, in India only about 2.2 % of the total fruits and vegetables produced are processed as compared to countries like the USA (65 %), Malaysia (83 %), the Philippines (78 %), France and Brazil (70 % each), etc (Sharangi & Datta, 2015).

Another challenge facing the African continent is the high post-harvest loss of agricultural produce and lack of food preservation. One-third of the food produced globally for human consumption, corresponding to about 1.3 billion tonnes, is lost or wasted each year along the food supply chain (FSC) (FAO, 2011). In SSA, the estimate is roughly 37 percent or 120–170 kg/year per capita. FSC includes the series of related activities used to produce, process, distribute and consume food (Nicastro & Carillo, 2021). The post-harvest chain involves a series of interconnected activities from the time of crop harvest, live animal sales at farm gate, eggs collected at farm gate, milk at immediate post-milking stage, or fish capture, to the delivery of the food to the consumer (Sugri *et al.*, 2021). The nature of activities varies considerably according to the type of food, and major differences exist among plant products (e.g., grains, roots and tubers, fruit and vegetables and pulses), livestock products (meat, dairy, eggs, hides and skins), and fish. As a product moves along the chain, losses may occur in 3 main categories: (i) quantitative or physical losses in weight of the product; (ii) loss of quality which changes the appearance, taste, texture or nutritional value of the product; and (iii) loss of opportunity for value of product.

The causes of PHL are classified into primary, secondary and tertiary factors which directly influence harvesting, handling, storage, processing, packaging, marketing and utilization of produce (Sugri *et al.*, 2021). The primary causes include inherent characteristics of produce (genetic), biological (pest and diseases), physiological (respiration, ripening, dormancy), environmental (e.g. weather

temperature, humidity), storage infrastructure (methods of storage, warehouses, cold-chains), and processing (traditional or advance processing facilities). The secondary factors include ancillary services that support the movement of goods from farm gates to market and consumers (eg. access to road network, transportation, and market information; cost of postharvest infrastructure and services; knowledge of handling) and consumer behaviour. The tertiary causes relate to external factors that directly impact on access and delivery of postharvest technologies and services (e.g. government policy and investments in agriculture, private sector participation and investments, advocacy groups and lobby in agriculture, etc.). To a large extent, the interaction of primary, secondary and tertiary factors determines the magnitude of PHL at any stage after harvest.

The largest post-harvest losses take place in the storage stage and are easier to estimate and prevent (Nicastro & Carillo, 2021). As previously mentioned, the causes of food losses vary across the world and between the same types of commodities. For example, low-income countries cause loss of fresh fruit and vegetables mostly as a result of inadequate infrastructure or lack of cold storage compared to industrialised countries. As a result, products are consequently destined for disposal due to a shorter shelf life and thus a higher perishability. This can also happen if the crop remains in a pile waiting to be transported and thus also exposed to heat and direct sunlight due to too long a period of waiting between the different stages of the FSC.

Table 1: Part of the initial production lost or wasted for each commodity group in different regions
(Nicastro & Carillo, 2021)

Region	Roots and tubers	Fruits and vegetables	Cereals	Fish and seafood	Meat	Dairy products
Europe	52%	46%	34%	31%	22%	12%
North America and Oceania	60%	52%	35%	49%	23%	20%
Industrialized Asia	48%	36%	34%	36%	21%	11%
Sub-Saharan Africa	45%	52%	19%	33%	27%	25%
North Africa, West and Central Asia	33%	56%	30%	30%	23%	20%
South and Southeast Asia	41%	52%	20%	35%	19%	22%
Latin America	39%	56%	26%	29%	21%	22%

2. Strategic Significance of Value Addition of African Agricultural Products

Value addition is defined as an activity that agricultural producers may utilize to produce a new commodity by changing its present place, time, and from one set of characteristics to other characteristics that are more preferred in the marketplace to obtain higher returns (Hinai *et al.*, 2022). Value addition is key to offsetting the poor positioning of any agricultural product in the market, building up the quality and branding, improving income, and increasing employment (Choudhary *et al.*, 2015). It is aimed to increase the year around availability and shelf-life of the commodity, improve off-farm employment opportunities, enhance the technology transfer and capacity building needs of the workers, increase the trade and economy of the country, and get a pathway out of the poverty.

The value addition is determined by calculating the difference between the raw product's value, cost, and other inputs and comparing it with the returns of the value-added products. It is important to determine the agricultural products that can be value-added which can support the market and enhance the income of the agricultural producers. In addition, there is a need to build up the technology and skills needed (technology transfer and capacity building) for product innovations.

On-farm value addition activity offers an alternative for diversification and rural development in the event of increasingly deregulated agricultural markets. In response to the global progress in agricultural production, many farmers have turned to participate in the value-added activities of agricultural crops to ensure their survival in the intense competition in the global markets. On the other hand, there are contrary reports from throughout the world on how the poorly handled postharvest systems result in an increase in postharvest losses and a decrease in farm net income.

Value addition plays an important role in overcoming the postharvest losses. It has significant implications on the farmers, suppliers, processors, distributors, and retailers who target to improve the growth rates, the market share, the customer satisfaction, and the sustainability issues in the business plans.

3. Problem Statement

Postharvest losses contribute to food shortages and ongoing food insecurity (Hinai *et al.*, 2022). Value addition in each aspect of agricultural produce creates more quality and adequate demand for the products. However, the growing market demand for quality and consistency in supply requires resources and necessary technical skills. There is a poor linkage between Research and Development institutions and the agro-value addition industry. Shortage of postharvest and value addition technical specialists and inefficient knowledge transfer from research stations to extension services are some constraints for needed outreach activities. Effective extension and training play a vital role in building capacity along the value chain by encouraging proper postharvest activities.

One-third of total food production worldwide is disposed of as losses and waste, which are associated with about a quarter of agricultural land, water, and fertilizers used in crop production. Efforts to reduce food loss and waste have recently received significant attention for their contribution to enhancing food security and environmental sustainability. Furthermore, demand for value-added agricultural produce is increasing due to income growth and increasing urbanization. Recently, there was plenty of attention towards increasing the availability of food and the expansion and diversification of agricultural products. This can be achieved by adding value to agricultural products and minimizing the postharvest losses which play an important role in improving the viability, profitability, and sustainability of agricultural products.

Value addition in agriculture is needed for the profitability of the farmers, to empower the farmers and weaker sections of the society, to provide safe, quality and branded food to the consumers, to reduce post-harvest losses, reduction in import and increasing exports, encourage the growth of subsidiary industries, to reduce the risk of marketing, to promote the crops diversification and to increase the financial stability of the farmers. Attentiveness to consumer demands in quality, variety and packaging are important. In order to be unique and novel, new product should be attempted.

4. Objectives for the Development of Value Addition Modules

- (1) What are the value added products, their procedures, hygiene, quality and marketing requirements? What are the food safety, quality and environmental concerns? Elaborate comprehensively the value-added products of the listed agricultural products, outlining both the technical and commercial products which are obtainable from them:
 - (i) ARS VAM 01:2023, *Mango*
 - (ii) ARS VAM 02:2023, *Pineapple*
 - (iii) ARS VAM 03:2023, *Banana and plantain*

- (iv) ARS VAM 04:2023, *Avocado*
- (v) ARS VAM 05:2023, *Citrus fruits*
- (vi) ARS VAM 06:2023, *Chillies, peppers and capsicums*
- (vii) ARS VAM 07:2023, *Onions, ginger, garlic*
- (viii) ARS VAM 08:2023, *Tomato*
- (ix) ARS VAM 09:2023, *Fruits value addition*
- (x) ARS VAM 10:2023, *Vegetables value addition*
- (xi) ARS VAM 11:2023, *Jackfruit and breadfruit*
- (xii) ARS VAM 12:2023, *Baobab and tamarind*
- (xiii) ARS VAM 13:2023, *Guava*
- (xiv) ARS VAM 14:2023, *Pumpkin*
- (xv) ARS VAM 16:2023, *Eggs*
- (xvi) ARS VAM 17:2023, *Beef, goat, sheep and small mammal meat processing, packaging, value addition and branding and marketing (including smoked beef, dried beef and sausages of all types)*
- (xvii) ARS VAM 18:2023, *Poultry meat processing, packaging, value addition and branding and marketing (including smoked chicken, dried chicken and sausages of all types)*
- (xviii) ARS VAM 19:2023, *Pig meat processing, packaging, value addition and branding and marketing (including smoked pork, dried pork and sausages of all types)*
- (xix) ARS VAM 20:2023, *Fish processing, packaging, value addition and branding and marketing (including dried fish, smoked fish, fish sausages)*
- (xx) ARS VAM 23:2023, *Potatoes (Sweet and Irish)*
- (xxi) ARS VAM 24:2023, *Cassava and yam*
- (xxii) ARS VAM 25:2023, *Sorghum, finger millet, pearl millet*
- (xxiii) ARS VAM 26:2023, *Oil seeds and nuts (cashew nuts, coconuts, peanuts, sesame, cotton seed, sunflower, canola, oil palm)*
- (xxiv) ARS VAM 28:2023, *Seaweed*

(2) The consultant shall be expected to catalogue the value added products in a detailed tabular format such as shown in Table 2 with references on the processes involved in attaining the required products.

Table 2: Sample of possible value-added products of fruits and vegetables

Fruit/vegetable	Possible value-added products
Banana	Dried banana, dried chips, starch, fried chips, jam, clarified juice, fruit bar, flour, alcoholic beverages, jelly,
Pineapple	Canned pineapple, pineapple pulp, juice, concentrate, dried pineapple, nectar, jam, (Kumar <i>et al.</i> , 2019)
Avocado	Fresh-cut avocado, avocado puree (sauce), guacamole, dehydrated avocados, frozen avocado, avocado oil, avocado paste, avocado powder,
Mango	Pulp, RTS, squash, powder, slices in brine, pickle, Pulp/juice from in situ mangoes, pectin from just-ripe fruits
Onion	Dehydrated onions, onion powder, onion oil, fresh-cut onions, onion vinegar, onion wine, onion paste, onion pickles
Chillies and peppers	Green chilli puree, powder, Green chilli paste, oleoresin
Tomato	Juice, sauce, ketchup, paste, Drying, powder

- (3) Bearing in mind that the products might be localized and traditionally processed, the consultant shall explore the areas of improvement to achieve hygiene, quality, safety and market compliance of the value-added products. It is recommended that the consultant combines process charts for product development as aids to understand the process and product pictorials as a means of enhancing comprehension. A non-binding example is provided in Figure 1.

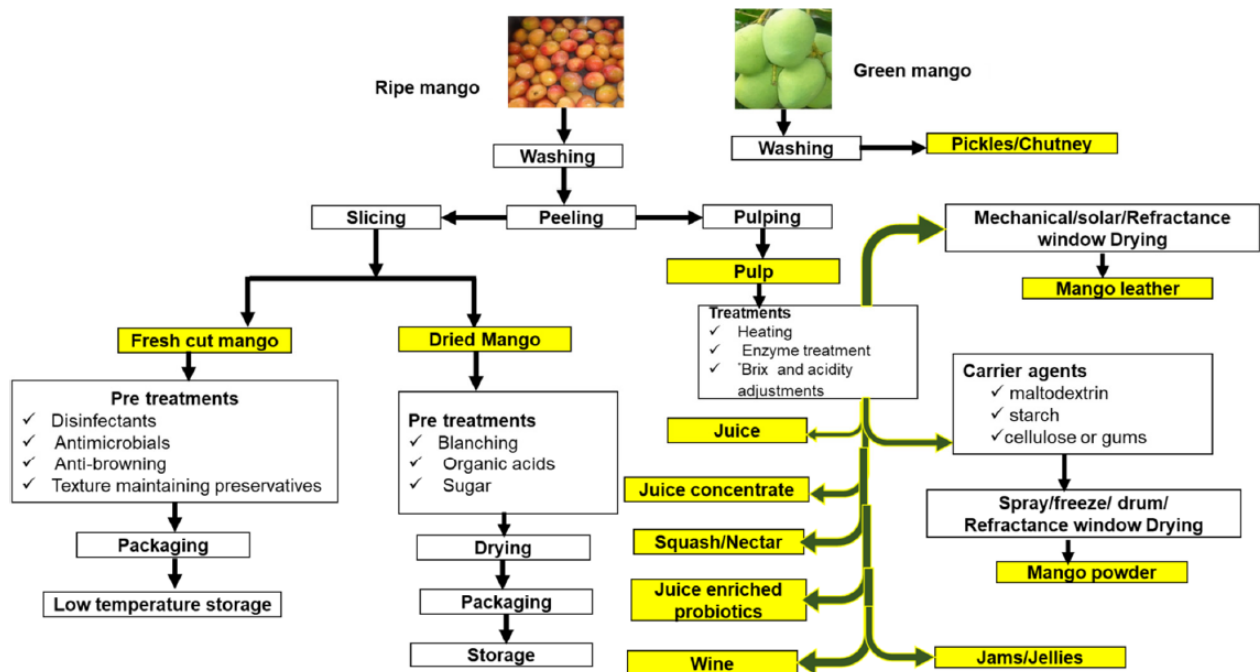


Figure 1: Processing of different products from mango (Owino & Ambuko, 2021)

- (4) What is the potential for standardization and conformity assessment of the primary and value-added products?

From a selection of the most significant value-added products, the consultant shall establish the criteria for the products to have standards and conformity assessment procedures established to facilitate certification and trade facilitation. If the value-added products are composites, this shall be illustrated clearly.

5. Nature of the Compilation

The consultant shall prepare the value addition modules in the form of dedicated chapters with sufficient details and illustrations of high clarity/resolution.

6. Value Addition Procedures

Value addition procedures shall be the core deliverables of the consultancy. The guidance provided in the preceding sections shall be utilized in addition to the best industry practices obtained from authoritative referenced sources. The value addition shall lead to standardization and certification of the products for placing in the market.

7. Implementation Methodology and Assignment Duration

In undertaking the tasks described above, the consultants will employ a combination of desk research, review of research articles and publications and telephone or web interviews with relevant stakeholders.

The consultancy shall be for a period of 6 months and the key deliverables are outlined below:

- Output 1: Inception report outlining the understanding of the task, issues to be addressed, methodology and sources of information; an annotated outline of the study (within 3 weeks after signing the contract)
- Output 2: Draft Value Addition Module (by the end of month 3)
- Output 3: Final Value Addition Module incorporating feedback from the validation workshop (by the end of month 6)
- Output 4: PowerPoint Presentation

8. Consultant Qualifications

- At least a Master's degree or equivalent in Agriculture, Zoological Sciences, Entomology, Food Sciences, or related areas.
- Track record and proof of research and publication in the area of scope of this assignment.
- Minimum of 5 years of professional experience working in Agriculture, Zoological Sciences, Entomology, Food Sciences, or related areas.
- Proven working experience on standardization and /or value addition will confer distinct advantage.
- Demonstrated involvement in policy formulation in the agricultural value chains, food security, as well as experience working with governments of the AU Member States and other relevant stakeholders is an asset.
- A consultant shall be limited to select a maximum of three (3) value addition modules.
- For this specific job opening fluency in English and/or French is required. Knowledge of the other is an asset.

9. Application process

Interested and qualified consultants should submit their applications for a maximum of three (3) value addition modules, the application should include the following:

1. A CV and demonstration of accomplishment of similar assignments
2. A technical proposal for implementing the assignment highlighting the consultant understanding of the scope of the work, methodology of Exclusivity and Availability for the duration of the assignment.
3. An outline of each value addition modules.
4. Financial proposal for completing the assignment highlighting the cost and its breakdowns.

10. Payment Schedules

The total payment shall be paid in two instalments as follows:

40% upon delivery of Draft Compilation (by the end of month 3).

60% upon delivering the Final Compilation and PowerPoint Presentations at the end of six months.

Formal application shall be done latest by **18th November 2022 before 5:00 p.m.**

Applications should be addressed to:

Secretary General

African Organisation for Standardisation (ARSO) Central Secretariat

International House 3rd Floor

P.O. Box 57363-00200 Nairobi-Kenya

Tel. +254-20-2224561, +254-20-311608

Preferably by e-mail to: info@arso-oran.org, arso@arso-oran.org, and arsopit@arso-oran.org



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