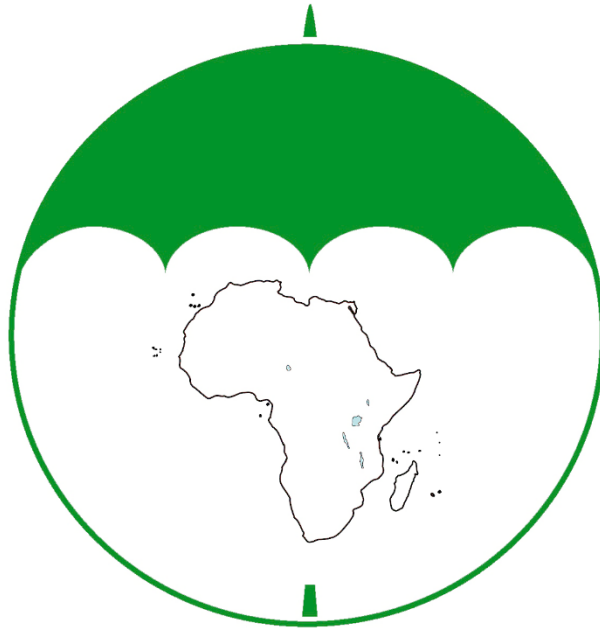


Terms of Reference



CONTRACTING ORGANIZATION	AFRICAN ORGANISATION FOR STANDARDISATION P. O. Box 57363 - 00200, NAROBİ, KENYA 3rd Floor, International House, Mama Ngina Street Tel: +254 20 2224561/311608 E-mail: arso@arso-oran.org
CONSULTANCY TERMS OF REFERENCE	COMPILATION (MONOGRAPHS) OF AFRICAN INDIGENOUS HERBS, SPICES AND CONDIMENTS AND THEIR VALUE ADDITION PROCESSES
CONSULTANT	
	P. O. Box
	Tel:
	Email:
	Duration:
	Total Pay: Financial Proposal

ARSO Central Secretariat
Nairobi, Kenya
April 2022

Compilation (monographs) of African indigenous herbs, spices and condiments and their value addition processes

1. Background

The word "indigenous" as an adjective often refers to the native, traditional or ancestral nature of an entity in a geographical location, which may or may not relate to indigenous peoples (FAO, 2021). The term 'indigenous foods' refers to plant- and animal-based foods (such as dairy) that are naturally existing and produced in specific locations and consumed as part of traditional diets (Rampa *et al.*, 2020). "Indigenous food systems (IFS)" refer to systems of cultivation, processing, storage, trade, and consumption, which are specific to particular geographic regions, and whose origins generally pre-date large-scale industrial agriculture (Keleman Saxena *et al.*, 2016). In this sense, "indigenous food systems" would include systems relying primarily on minor and/or endemic food crops (including native or underutilized species), or farmer-saved varieties of major food staples, such as corn, rice, and wheat. A traditional crop is an indigenous species native to a specific region or one that was introduced a long time ago and, due to long use, has naturalized and become part of the culture of a community (Maundu, 1997; Muthoni & Nyamongo, 2010). African indigenous vegetables are defined as 'all categories of plants whose leaves, fruits or roots are acceptable and used as vegetables by rural and urban communities through custom, habit and tradition' (Muhanji *et al.*, 2011). African leafy vegetables may be defined as species of plants that are either genuinely native to a particular region, or plant species that were introduced to that region so long ago so as to have evolved through natural processes or farmer selection (van Rensburg *et al.*, 2007). In this paper, the term indigenous and traditional food crops (ITFCs) shall carry the meaning of traditional food crops including cereals, pulses, oilseeds, nuts, fruits, vegetables, roots and tubers used by African indigenous communities.

Other terminologies used to describe indigenous and traditional crops include the following:

Neglected crops: *"Neglected crops are those grown primarily in their centres of origin by traditional farmers, where they are still important for the subsistence of local communities. Some species may be widely distributed around the world but tend to occupy special niches in the local ecology and in local production and consumption systems. While these crops continue to be maintained by sociocultural preferences and the ways they are used, they remain inadequately documented and neglected by formal research and conservation"* (IPGRI, 2002).

NUS: *"Acronym standing for Neglected and Underutilized Species and applied to useful plant species which are marginalized, if not entirely ignored, by researchers, breeders and policy makers; they belong to a large, biodiverse group of thousands of domesticated, semi-domesticated or wild species; they may be locally adapted minor crops as well as non-timber forest species. The 'NUS' term is a fluid one, as when a crop is simultaneously a well-established major crop in one country and a neglected minor crop in another. NUS tend to be managed with traditional systems, use informal seed sources and involve a strong gender element".* In a wider sense, the term NUS also could be used to refer to animal species. (Padulosi *et al.*, 2013).

Orphan crops: *"Orphan crops are defined as crops that have either originated in a geographic location or those that have become 'indigenized' over many years (> 10 decades) of cultivation as well as natural and farmer selection. The term 'orphan' has often been used to refer to crops that may have originated elsewhere, but have undergone extensive domestication locally, thus giving rise to local variations, i.e., 'naturalized/indigenized crops'".* (Mabhaudhi *et al.*, 2019)

Underutilized crops: “Underutilized crops were once grown more widely or intensively but are falling into disuse for a variety of agronomic, genetic, economic and cultural reasons. Farmers and consumers are using these crops less because they are in some way not competitive with other species in the same agricultural environment. The decline of these crops may erode the genetic base and prevent distinctive and valuable traits being used in crop adaptation and improvement”. (IPGRI, 2002).

Indigenous and traditional foods crops (ITFCs) have multiple uses within society, and most notably have an important role to play in the attempt to diversify the food in order to enhance food and nutrition security (Akinola *et al.*, 2020). However, research suggests that the benefits and value of indigenous foods within the African context have not been fully understood and synthesized. Their potential value to the African food system could be enhanced if their benefits were explored more comprehensively.

Indigenous foods, knowledge and technologies can contribute to the ‘People’ dimension of the SDG 2030 Agenda in two important ways: firstly, by providing access to healthy and nutritious foods that are affordable for the poor, and secondly, by empowering the growers, producers and processors of these foods. Because indigenous foods are often grown and sold by women (and sometimes youth), developing this sector may empower them in terms of offering a more regular or stable income, or increasing women’s freedom to make economic choices, e.g. to invest (Balderman *et al.* 2016, Chivenge *et al.* 2015). A related social dimension is that the traditional knowledge attached to indigenous foods, can lead not only to acknowledgement of and respect for people’s cultural identity, but can also contribute to new or better uses or improved processing technologies of the indigenous products themselves.

2. Strategic significance of indigenous African herbs and spices

While there is no globally established or agreed definition for culinary herbs and spices, it is recognized that herbs are obtained from the leaves of herbaceous (non-woody) plants and spices are obtained from roots, flowers, fruits, seeds or bark. Further, spices are native to warm tropical climates and can be woody or herbaceous plants (Opara & Chohan, 2021). Spices are dried seeds, fruits, roots, barks or vegetable substances used primarily to flavour, colour or preserve food in the culinary arts. It is any dried part of a plant used for these three purposes but not as the main ingredient. Culinary herbs and spices are the edible parts of plants that are traditionally added to foodstuff for their natural flavourings, aroma, visual appearance and preservative purposes (Asowata-Ayodele *et al.*, 2016).

Spices and herbs have been used in African countries since ancient times not only to give taste and flavour to foods but also as food preservatives and to prevent and cure diseases (Pavela *et al.*, 2016). Indigenous herbs and spices such as *ajowan*, *buchu*, coffee, *geisho*, Guinea pepper, Indian borage, *karkade*, *korarima*, *koseret*, Melegueta pepper and tamarind are widely used in the many cooking traditions in Africa but, as in many other parts of the world, chilli peppers and other exotic spices have become popular or even dominant (van Wyk, 2014). Herbs and spices have a rich history of traditional use for their culinary effect, as well as their ability to prevent and treat chronic health maladies. Several herbs and spices such as garlic, ginger, ginseng, turmeric, cinnamon, cayenne pepper and cardamom are of particular interest in view of their modulatory effects on atherosclerosis, cancer, diabetes, obesity, inflammation, arthritis, immune deficiency, free radicals, microbes, ageing and mental health (Asowata-Ayodele *et al.*, 2016)

Relatively recent research has now added to the long history of these foods (Opara & Chohan, 2021). The last two decades have revealed an array of properties conferred via secondary compounds that are bioactive phytochemicals – many of which are alkaloids, phenolic acids, flavonoids and terpenoids and possess, amongst others, antioxidant, anti-microbial, anti-inflammatory, anti-diabetic and anti-cancer activities. Based on a growing amount of evidence, many of these culinary herbs and spices are purported to be of benefit in the maintenance of health and the prevention of chronic non-communicable diseases including type 2 diabetes, obesity, metabolic syndrome neurodegenerative diseases, including Alzheimer's disease, cancer, cardiovascular disease, and chronic inflammation, which now gives their daily/habitual/routine use a whole new meaning. Commentaries and information about these foods now extend beyond their culinary use. Not only have they led to position papers on, and research about, their use as alternatives to fat, salt and sugar to flavour food and to encourage the consumption of vegetables, but also they have led to discussions in scientific literature about the levels of consumption that might confer benefit – an area that is extremely challenging due to their subjective use – and their potential uses due to their bioactive constituents.

3. Problem Statement

The current annual global trade in spices is 0.6–0.7 million tonnes valued at US \$3–3.5 billion (Peter, 2012). The value of the spice trade is particularly dependent on pepper prices as pepper remains the main spice in international trade. The global trade in spices is expected to increase with growing consumer demand in importing countries for more exotic, ethnic tastes in food. About 85 % of spices are traded internationally in whole form, with importing countries processing and packaging the final product for the food industry and the retail market. The trade in processed and value-added spice ingredients is, however, growing rapidly as importers look for cheaper global sourcing of spice products and exporting businesses develop the appropriate technologies and quality systems. There is limited competition from synthetic products, with the exception of vanilla, particularly given consumer preferences for 'natural' ingredients in food products. The USA is the biggest importer of spices and spice products, followed by Germany and Japan. The total value of spice imports in to the USA increased from US \$426 million in 1998 to \$597 million in 2007 (www.ers.usda.gov). Germany is the largest consumer of spices and herbs in the EU. The annual consumption of herbs and spices in Germany amounted to 62 000 tonnes with an annual average growth rate of 9.7 % between 2004 and 2008 (www.cbi.eu). Other major importing regions are the Middle East and Africa.

The African continent has a favourable climate for the production of a wide range of herbs and spices but is currently under-producing them. Where production is done, these herbs and spices are (1) sold whole without standardized value addition, (2) poor pest/disease protection measures lead to produce rejection, (3) poor agricultural practices lead to low productivity and under-expressed product characteristics, (4) poor observation of pesticide application leading to exceedance of pesticide residue limits, and (5) poor post-harvest handling leading to produce waste and rejection.

4. Objectives for the Study on indigenous African herbs and spices

- (1) Identify and document indigenous African herbs, spices and condiments and their application for food taste, flavouring and colouring; food preservation; and health applications.

- (2) Develop an inventory of the indigenous African herbs, spices and condiments including their geographical distribution range, parts used, products commonly derived from the plants and dietary/health targets/benefits in a tabular format as shown in Table 1.

Table 1: Inventory of African indigenous herbs, spices and condiments

No	Taxon	Common crop name	Distribution	Used plant parts	Uses and products
1	<i>Aframomum melegueta</i> K. Schum.	Grains of paradise, Guinea pepper, Melegueta pepper	Democratic Republic of Congo, Nigeria, Gabon, Ghana, Cote D'Ivoire, Liberia, Cameroon, Sierra Leone, Togo, Uganda	Fruits; Seeds; Leaves	Aphrodisiac, against measles and leprosy (leaves), for excessive lactation and postpartum haemorrhage, as a purgative, galactagogue and anthelmintic, and as a haemostatic agent. The seeds are used as flavouring for beverages, meats, ice cream, candy, and bread

- (3) Please provide clear illustrations of the crops through your own original photographs or copied photographs from other sources which are bibliographically referenced in respect of copyright regulations.

- (4) Please elaborate the trade and economic significance of the crop and its potential for expanded trade if promoted and value added.

- (5) What are their environmental production requirements?

Well referenced highlight on the environmental conditions in which the crops perform well. Please indicate adaptations to biotic and abiotic stress conditions of the crops.

- (6) What is the geographical distribution of the crop?

A map showing the geographical distribution of the crop from an authoritative source shall be inserted

- (7) What are the guidelines for their primary production? What are the agronomic practices pertaining to optimal performance of the crops?

This includes, but is not limited to the various impacts of different fertilization schemes (organic or chemical fertilizers, doses and frequencies of applications), soil tillage regimes (tillage vs. no tillage), irrigation practices (doses and frequencies of water supply, waterlogging), planting densities, crop pests and diseases, crop protection strategies and products, and harvesting modes (e.g., rooting, cutting, leaf picking) on growth, regrowth (when applicable), and overall yield are important factors to take into account throughout the breeding process. What are the common crop diseases and crop protection methods and products?

The agronomic practices may be accompanied by illustrations to promote better understanding.

- (8) What are the value added products, their procedures, hygiene, quality and marketing requirements?

This section shall demonstrate the procedures for value added products obtained or potentially obtainable from the various indigenous African crops. 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.

- (9) 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 compilation in the form of a compendium of monographs 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 Compilation (by the end of month 3)
- Output 3: Final Compilation 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, Biological Sciences, Food Sciences, or related areas.
- Track record of research and publication in the area of scope of this assignment.
- Minimum of 5 years of professional experience working in Agriculture, Biological Sciences, 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, as well as experience working with governments of the AU Member States and other relevant stakeholders is an asset.
- 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 African indigenous herbs, spices and condiments, 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 the Compilation (monographs) of African indigenous herbs, spices and condiments and their value addition processes.
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

REFERENCES

- Akinola, R., Pereira, L. M., Mabhaudhi, T., de Bruin, F.-M., & Rusch, L. (2020). A Review of Indigenous Food Crops in Africa and the Implications for More Sustainable and Healthy Food Systems. *Sustainability*, 12(8), 3493. <https://doi.org/10.3390/su12083493>
- Asowata-Ayodele, A. M., Afolayan, A. J., & Otunola, G. A. (2016). Ethnobotanical Survey of Culinary Herbs and Spices Used in the Traditional Medicinal System of Nkonkobe Municipality, Eastern Cape, South Africa. *South African Journal of Botany*, 104(216), 69–75. <https://doi.org/10.1016/j.sajb.2016.01.001>
- FAO. (2021). *The White/Wiphala Paper on Indigenous Peoples' Food Systems*. Food and Agriculture Organization of the United Nations (FAO). <https://doi.org/10.4060/cb4932en>
- IPGRI. (2002). *Neglected and Underutilized Plant Species: Strategic Action plan of the International Plant Genetic Resources Institute*. International Plant Genetic Resources Institute, (IPGRI). https://www.biodiversityinternational.org/fileadmin/_migrated/uploads/tx_news/Neglected_and_underutilized_plant_species_837.pdf
- Keleman Saxena, A., Cadima Fuentes, X., Gonzales Herbas, R., & Humphries, D. L. (2016). Indigenous Food Systems and Climate Change: Impacts of Climatic Shifts on the Production and Processing of Native and Traditional Crops in the Bolivian Andes. *Frontiers in Public Health*, 4. <https://doi.org/10.3389/fpubh.2016.00020>
- Mabhaudhi, T., Chimonyo, V. G. P., Hlahla, S., Massawe, F., Mayes, S., Nhamo, L., & Modi, A. T. (2019). Prospects of Orphan Crops in Climate Change. *Planta*, 250(3), 695–708. <https://doi.org/10.1007/s00425-019-03129-y>
- Maundu, P. M. (1997). The Status of Traditional Vegetable Utilization in Kenya. *Promoting the Conservation and Use of Underutilized and Neglected Crops*, 66–75. https://scholar.google.com/scholar_lookup?title=The+status+of+traditional+vegetable+utilization+in+Kenya&author=Maundu%2C+P.M.+%28National+Museums+of+Kenya%2C+Nairobi+%28Kenya%29%29&publication_year=1997
- Muhanji, G., Roothaert, R. L., Webó, C., & Stanley, M. (2011). African Indigenous Vegetable Enterprises and Market Access for Small-Scale Farmers in East Africa. *International Journal of Agricultural Sustainability*, 9(1), 194–202. <https://doi.org/10.3763/ijas.2010.0561>
- Muthoni, J., & Nyamongo, D. O. (2010). Traditional Food Crops and Their Role in Food and Nutritional Security in Kenya. *Journal of Agricultural & Food Information*, 11(1), 36–50. <https://doi.org/10.1080/10496500903466745>
- Opara, E. I., & Chohan, M. (2021). *Culinary Herbs and Spices: A Global Guide* (1st Ed). Royal Society of Chemistry. www.rsc.org
- Padulosi, S., Thompson, J., & Rudebjer, P. (2013). *Fighting Poverty, Hunger and Malnutrition with Neglected and Underutilized Species (NUS): Needs, Challenges and the Way Forward*. Biodiversity International. https://www.biodiversityinternational.org/fileadmin/_migrated/uploads/tx_news/Fighting_poverty_hunger_and_malnutrition_with_neglected_and_underutilized_species_NUS_1671.pdf
- Pavela, R., Maggi, F., Mbuntcha, H., Woguem, V., Fogang, H. P. D., Womeni, H. M., Tapondjou, L. A., Barboni, L., Nicoletti, M., Canale, A., & Benelli, G. (2016). Traditional Herbal Remedies and Dietary Spices from Cameroon as Novel Sources of Larvicides Against Filariasis Mosquitoes? *Parasitology Research*, 115(12), 4617–4626. <https://doi.org/10.1007/s00436-016-5254-4>
- Peter, K. V. (2012). *Handbook of Herbs and Spices: Volume 1* (2nd Ed). Woodhead Publishing Limited. www.woodheadpublishing.com
- Rampa, F., Lammers, E., Linnemann, A. R., Schoustra, S. E., & de Winter, D. (2020). *Pathways to Improved Food and Nutrition Security of the Poor: The Promise of African Indigenous Foods and Technologies* (pp. 1–25). Food & Business Knowledge Agenda, Netherlands Ministry of Foreign Affairs. https://knowledge4food.net/wp-content/uploads/2020/03/FBRsynthesis02_LocallIndigenousFoods_paper.pdf
- van Rensburg, J., Averbek, W. van, Slabbert, R., Faber, M., van Jaarsveld, P., van Heerden, I., Wenhold, F., & Oelofse, A. (2007). African Leafy Vegetables in South Africa. *Water SA*, 33(3 (Special Edition)), 317–326.
- van Wyk, B.-E. (2014). *Culinary Herbs and Spices of the World*. University of Chicago Press.