Food and Agriculture Organization of the United Nations

Compendium of forgotten foods in Africa

A companion publication for

Integrating Africa's forgotten foods for better nutrition

FARA
Forum for Agricultural Research in Africa

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Foreword

Efforts to provide solutions for food and nutrition security in Africa have given attention to the use of indigenous and underutilized food commodities. Generally, these food commodities are relatively widely used in some communities and cultures as they are entrenched as traditional food. They are reported to have a strong potential to contribute to food energy and nutrient needs as they are dense in nutrients and are well adapted to the various natural resource domains. Their potential is not realized due to long years of neglect or slight consideration by researchers and development practitioners. Researchers who are interested in these commodities largely lack funding support since these commodities are not part of the big six food commodities supported across the globe. They are labelled as forgotten foods because they are forgotten by the research funders, researchers and development practitioners.

Recent efforts propelled by the UN Food Systems Summit and supported by the Global Forum for Agricultural Research (GFAR) have supported the development of various continental manifestos on forgotten foods. The Africa manifesto has five pillars, each with prospective actions. The first pillar is to establish a dedicated and functional research and innovation system for the holistic development of forgotten foods. One of the prospective actions to implement this pillar is to conduct an exhaustive identification and characterization of forgotten foods in Africa.

As a first step, the Food and Agriculture Organization of the United Nations (FAO) Regional Office for Africa, in partnership with the Forum for Agricultural Research in Africa (FARA), supported the scoping study to carry out a comprehensive identification and documentation of the forgotten foods. This study led to the development of two separately published documents: this *Compendium of forgotten foods in Africa* and the companion publication, *Integrating Africa's forgotten foods for better nutrition*. The compendium provides a pictorial presentation of the compiled food commodities in Africa. It is packaged as an essential resource to encourage the increased use of these commodities in the food system and to attract the interest of research funders and other practitioners.

We recommend these two vital resources to all stakeholders in African agriculture, food and nutrition issues to drive the mainstreaming of forgotten foods into the African food system.

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Purpose and scope of the compendium

The Food and Agriculture Organization of the United Nations (FAO), through its Sustainable Food Systems Concept and Framework (FAO, 2018), contends that the vision and actions for food system changes must be firmly grounded in reliable data. This compendium is a comprehensive collection of 100 forgotten food crops of Africa as prioritized by stakeholders from across the continent. It contains credible information and data on botanical classification, agroecological suitability, agronomic requirements, traditional and medicinal uses, value-added prospects and nutritional content (expressed per 100 g of edible portion on fresh weight basis for the raw food).

The compendium serves as the first concrete action spearheaded by FAO and the Forum for Agricultural Research in Africa (FARA) in response to the UN Food Systems Summit and the Call for Collective Action in the Global Manifesto on Forgotten Foods (GFAR, 2021). Specifically, the compendium contributes directly to the four main action areas identified at the UN Food Systems Summit:

- ensuring access to safe and nutritious food for all;
- shifting to sustainable consumption patterns;
- boosting nature-positive production at scale;
- advancing equitable livelihoods; and
- building resilience to vulnerabilities, shocks and stress.

Intended as a sourcebook to enhance the knowledge of users working on various aspects of forgotten foods, the compendium should be useful to researchers, nutritionists, policy makers, development practitioners and other interested stakeholders. Ultimately, we expect that the compendium will help guide promotional efforts, behaviour change communication, scientific research and policy formulation on forgotten foods.

NOTABLE UNDER-RESEARCHED FOODS

Some of the foods are less researched than others, thus the nutrient information is lacking for those foods and a nutritional composition table has therefore been omitted.

This underlines their status as truly forgotten foods, though they are by no means less important than the other more well-researched commodities. Our hope is that this lack of information will spur investigations into the properties and potential uses of these foods for the benefit of Africa and the world.

Abbreviations and acronyms

CSIR	Council for Scientific and Industrial Research
FAO	Food and Agriculture Organization of the United Nations
FARA	Forum for Agricultural Research in Africa
GFAR	Global Forum for Agricultural Research
SARI	Savannah Agricultural Research Institute

UNITS OF MEASURE

tr	trace
µg	microgram
g	gram
kcal	kilocalorie
mg	milligram

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Introduction

The agrifood system covers the journey of food from farm to table – including when it is grown, fished, harvested, bought, prepared, eaten and disposed of (FAO, 2023). The agrifood system has a bearing on human capital development, provision of jobs, industrial growth, structural transformation and ecosystem services. As in many other parts of the world, the landscape of African agrifood systems is fraught with fragility and fails to deliver on these key developmental outcomes. Transforming agrifood systems in Africa is an imperative for the realization of the UN's Sustainable Development Goals, which now have a delivery timeline of less than a decade.

A sustainability framework must undergird any attempts at food system transformation. For example, Africa must provide food and nutrition security to its rapidly expanding population in perpetuity without engendering adverse environmental, social and economic effects. The massive endowment of the continent with extensive arable land and diverse agroecosystems teeming with rich flora makes sustainable food systems a realizable dream. Indeed, Indigenous communities across Africa have used a number of locally adapted crops for millennia for nutrition, medicinal and ornamental purposes. Unfortunately, many of these crops have been progressively substituted with imported genotypes favoured by industrial agriculture. Pervasive monoculture of the exotic crops and increasingly standardized diets have contributed to the utter denigration of the indigenous crops, earning them the appellation "forgotten crops".

Meanwhile, Africa continues to bear the burden of malnutrition. Indeed, a recent edition of the *State of Food Security and Nutrition in the World* indicates that the region has the highest prevalence of undernourishment at 20.2 percent (FAO *et al*., 2023). A key underlying cause of malnutrition in Africa is lack of access to food. Nearly 60 percent of people in Africa still live in rural areas (World Bank, 2018) where own-farm production is the predominant means to food access. As rural agriculture is predominantly rain-fed, climate variability regularly curtails farm output and, consequently, food access. In addition, prolonged monoculture of exotic crops has led to biodiversity loss, degradation of natural capital and low dietary diversity.

The so-called forgotten food crops are nutritious, resilient and adaptable to local dietary practices. They thus offer a viable pathway to ensuring adequate food intake and dietary diversity, maintaining soil health, and achieving climate resilience amongst African farming communities. Mainstreaming forgotten foods in the daily diets of African communities should therefore be a core component of any attempts at sustainable food system transformation in the region.

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COMMON NAME

Aerial yam

SCIENTIFIC NAME

Dioscorea bulbifera

Agroecological diversity

A herbaceous climbing vine producing below-ground tubers and aerial bulbils. Aerial yam requires a temperatures of 25–30°C, rainfall of 1000–1800mm per year, abundant sunshine and a well-drained sandy-loamy soil, rich in humus.

Agronomic and edaphic requirements

Propagated mainly by yam setts, yam seeds or yam mini setts from both the aerial tuber and the underground corms. Spacing is 90 × 100cm, while for yam mini setts it is 25 × 100cm. Sprouting occurs three to six weeks after planting. Mulch with dry leaves to conserve moisture, reduce soil temperature and prevent rotting. Apply 200kg (four bags) of NPK fertilizer per hectare three months after planting. Stake and train the vines, which mature 8–12 months after planting. Pests include yam shoot beetles and rodents. Diseases include yam mosaic disease and yam rot.

Environmental and economic benefits

Source of income for farmers.

Traditional culinary art

Yams are cooked, baked or fried. The aerial and the underground tubers are edible after processing to remove the bitter taste and the antinutritional factors.

Value-added processing technologies and products

Dried and milled into flour for making chips and baked products.

Potential for use as livestock feed

Leaves used as forage.

Potential for use as an industrial raw material

Production of flour and starch.

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COMMON NAME

African black plum

SCIENTIFIC NAME

Vitex doniana

Agroecological diversity

African black plum is a medium-sized deciduous tree common across tropical sub-Saharan Africa's coastal savannas and savanna woodlands including Kenya and Nigeria. It grows up to 25m high. Annual daytime temperature range 14–28°C and mean annual rainfall range 750–2000mm. The tree prefers well drained light (sandy), medium (loamy) and heavy (clay) soils with mildly acidic pH in the range 5.5–7, though it can also handle more acidic soils. It can grow in nutritionally poor soil.

Agronomic and edaphic requirements

Propagated from seeds.

Environmental and economic benefits

Lightweight, termite-resistant wood is used for light building material, furniture, carvings and boats. It also makes a good fuel and charcoal. Ornamental. Dried fruits, young leaves and bark produce an ink. Twigs are used as chewing stick for teeth cleaning. Roots fix atmospheric nitrogen.

Nutritional composition

FRUITS

Energy (kcal)	112
Calcium (mg)	25
Water (g)	70.1
Iron (mg)	1.1
Protein (g)	0.4
Zinc (mg)	0
Fat (g)	0.2
Vitamin A (RE) (µg)	tr
Carbohydrates avail. (g)	26.4
Folate (µg)	-
Crude fibre (g)	1.40

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 05_055)

Traditional culinary art

Juice can be fermented to produce a fruit wine. The young leaves are cooked as a vegetable. Fruits can be eaten raw or cooked. They can also be made into a jam or wine. Seeds are roasted and used to make a coffee-like drink.

Value-added processing technologies and products

Jam and wine.

Potential for use as livestock feed

Animal fodder.

Potential for use as an industrial raw material

Dried seeds yield oil which can be used for skin cream, resin and paint production.


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COMMON NAME

African eggplant

SCIENTIFIC NAME

Solanum aethiopicum

Agroecological diversity

Cultivated in Africa, Brazil, the Caribbean and southeast Asia. Humid lowlands, dry savannas and uplands with annual temperature range of 20–30°C. Not tolerant of frost. Requires moderately fertile, well-drained, deep soils with a pH of 5.5–6.8. Rainfall 500–1200mm. Altitude up to 1200m. Grows best in full sun.

Agronomic and edaphic requirements

Propagated by seeds spaced 50 cm apart and 75 cm between rows. Frequent irrigation during the dry season, particularly when fruiting. Addition of fertilizer in the form of compost or cattle or chicken manure will improve yields. Harvested 100–120 days after planting. Young leaves may be harvested after 45–60 days of growth. Diseases include bacterial wilt, fusarium wilt, late blight, Alternaria blight. Pests include aphids, spider mites, shoot and fruit borers, tobacco whiteflies and root-knot nematodes.

Environmental and economic benefits

Ornamental.

Nutritional composition

FRUITS

Energy (kcal)	65
Calcium (mg)	16
Water (g)	90
Iron (mg)	0.9
Protein (g)	1.2
Zinc (mg)	0.19
Fat (g)	5.80
Vitamin A (RE) (µg)	61
Carbohydrates avail. (g)	1.0
Folate (µg)	17
Crude fibre (g)	2.0

Source: World Vegetable Center phytonutrient data, 2023 (food codes: TWN0322, TWN0321, TWN0320, TWN0319, TWN0318, TWN0155)

Traditional culinary art

Its bitter orange-red fruit is eaten boiled, steamed, pickled or added to stews with meat and other vegetables. Young leaves are also used in soups.

Potential for use as livestock feed

Livestock fodder.


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COMMON NAME

African jointfir

SCIENTIFIC NAME

Gnetum africanum

Agroecological diversity

A perennial vine found in tropical Africa. It grows around 10m long and thrives in a wide range of habitats, including farm fallows, abandoned farmland, secondary forests and closed forests. It grows best in shaded areas at altitudes up to 1200m and a mean annual rainfall of 3000mm.

Agronomic and edaphic requirements

Propagation using leafy stem cuttings or via rhizomes. The first harvest takes place 6–9 months after planting. The total lifespan is estimated at over 10 years. Major pests include mealybugs and termites.

Environmental and economic benefits

Source of income. Used as food in times of famine.

Nutritional composition

LEAVES

Energy (kcal)	-
Calcium (mg)	-
Water (g)	85
Iron (mg)	-
Protein (g)	5.1
Zinc (mg)	-
Fat (g)	0.7
Vitamin A (RE) (µg)	-
Carbohydrates avail. (g)	-
Folate (µg)	-
Dietary fibre (g)	-

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 04_080)

Traditional culinary art

Leaves are used as a vegetable for soups and stews. It is also cooked with meat or fish and occasionally consumed as a salad.

Value-added processing technologies and products

Leaves are dried for later use.

Potential for use as livestock feed

Leaves are used as animal feed.


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COMMON NAME

African locust bean

SCIENTIFIC NAME

Parkia biglobosa

Agroecological diversity

African locust bean is a perennial deciduous tree that grows in west Africa, southern Sudan, northern Uganda and in other warm, temperate and subtropical zones. Altitude from sea level up to around 300m, mean annual rainfall of 400–700mm and mean annual temperature of 24–28°C.

Agronomic and edaphic requirements

Propagated by seeds, cuttings and grafting. Flowers after 5–7 years and fruits after 5–10 years.

Environmental and economic benefits

Foliage improves soil fertility. Flowers used by bees for nectar. Wood, shade and land improvement.

Nutritional composition

DRY SEEDS

Energy (kcal)	406
Calcium (mg)	330
Water (g)	7.8
Iron (mg)	14.0
Protein (g)	29
Zinc (mg)	5.15
Fat (g)	13.8
Vitamin A (RE) (µg)	0
Carbohydrates avail. (g)	37.8
Folate (µg)	380
Crude fibre (g)	7.2

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 03_009)

FRUIT

Energy (kcal)	285
Calcium (mg)	118
Water (g)	13.6
Iron (mg)	3.6
Protein (g)	3.3
Zinc (mg)	0.77
Fat (g)	1.8
Vitamin A (RE) (µg)	405
Carbohydrates avail. (g)	49.9
Folate (µg)	-
Dietary fibre (g)	28.2

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 05_001)

Traditional culinary art

Seeds are processed into seasoning. Pulp is used in beverages.

Value-added processing technologies and products

Seeds are dried and fermented for sale.

Potential for use as livestock feed

Leaves and seeds used to feed livestock and poultry.

Potential for use as an industrial raw material

Making beverages.


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COMMON NAME

African nightshade

SCIENTIFIC NAME

Solanum nigrum

Agroecological diversity

African nightshade grows in most of Africa and in tropical and subtropical climates around the world. It grows both as a cultivated crop and an uncultivated weed. Rainfall 500–1200mm, altitude 0–1700m, temperature range 20–25°C. Requires soils with high levels of organic matter. Typically grows in warm, humid forests.

Agronomic and edaphic requirements

Propagated by seed or cuttings. Frequent irrigation is required to avoid water stress and have optimum growth. Fertilizer or organic manure are applied during planting. Seeds are obtained by bursting ripe fruit and sun drying the contents. Plants mature 60 days after direct seed sowing in the field or 30 days after transplanting. They are harvested twice a week. Pests include root-knot nematodes, cut worms, flea beetles and aphids. Diseases include bacterial blight and early blight.

Environmental and economic benefits

The deep roots help stabilize the soil. Dense cover helps protect the ground and preserve moisture. Fixes atmospheric nitrogen.

Nutritional composition

LEAVES

Energy (kcal)	85
Calcium (mg)	847
Water (g)	74.2
Iron (mg)	5.9
Protein (g)	5.2
Zinc (mg)	-
Fat (g)	1.70
Vitamin A (RE) (µg)	2674
Carbohydrates avail. (g)	9.4
Folate (µg)	-
Crude fibre (g)	5.7

Source: Priority food tree and crop food composition database, 2019 (food code: V0024)

Traditional culinary art

Leaves and shoots are blanched, boiled, fried or cooked as vegetables.

Value added processing technologies and products

Berries used in jam and pies.

Potential for use as livestock feed

Fodder for cattle and goats.

Potential for use as an industrial raw material

Leaves dried for future use. Berries used in jam and pies.


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COMMON NAME

African okra

SCIENTIFIC NAME

Abelmoschus esculentus

Agroecological diversity

Okra is cultivated in tropical and subtropical regions with temperatures above 20°C and latitudes of 35°–40°. It requires fertile light or heavy soils.

Agronomic and edaphic requirements

Propagated by seed

Environmental and economic benefits

Sold as traditional vegetable forage. Used as manure.

Nutritional composition

LEAVES

Energy (kcal)	46
Calcium (mg)	303
Water (g)	85.2
Iron (mg)	0.6
Protein (g)	2.5
Zinc (mg)	0.46
Fat (g)	0.6
Vitamin A (RE) (µg)	134
Carbohydrates avail. (g)	5.1
Folate (µg)	57
Dietary fibre (g)	4.9

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 04_004)

FRUITS

Energy (kcal)	34
Calcium (mg)	87
Water (g)	89.1
Iron (mg)	0.8
Protein (g)	1.7
Zinc (mg)	0.55
Fat (g)	0.2
Vitamin A (RE) (µg)	86
Carbohydrates avail. (g)	4.2
Folate (µg)	88
Dietary fibre (g)	4.1

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 04_017)

Traditional culinary art

Pods boiled as a vegetable. Seeds eaten fresh. Leaves cooked to thickens soups and stews.

Value-added processing technologies and products

Mature pods are roasted, ground and used as a coffee substitute.

Potential for use as livestock feed

Leaves used for forage or fodder.

Potential for use as an industrial raw material

Leaves dried and ground to a powder.


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COMMON NAME

African pepper

SCIENTIFIC NAME

Aframomum melegueta

Agronomic and edaphic requirements

A drought-resistant herbaceous perennial plant native to the west African forest region and known for the spice produced from its seeds. Its seeds are also called grains of paradise. It is propagated using cuttings and tubers. It produces long pods with capsule sets of reddish brown seeds and trumpet-shaped purple flowers.

Environmental and economic benefits

Source of income for farmers. Leaves are used for bedding materials.

Traditional culinary art

Seeds are ground and used as a spice known for tis tropical scent and flavour. Often used as a replacement for pepper. Used in flavouring sausage and beer. Spice for meats, sauces and soups.

Value-added processing technologies and products

Spice powder.

Potential for use as an industrial raw material

Spice used to flavour beer, wine, spirits and vinegar.


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COMMON NAME

African spiderflower

SCIENTIFIC NAME

Gynandropsis gynandra

Agroecological diversity

An annual wildflower indigenous to Africa. It grows in temperate to tropical zones with daytime temperature in the range 0–35°C. It prefers full sun and well-drained fertile soil of pH 5.5–8.

Agronomic and edaphic requirements

Seed propagation. Shallow planting at 1cm depth and with 30cm between rows. Optimum yields can be obtained by applying 20 to 30 tonnes of manure per hectare. Attacked by aphids, beetles and thrips. The seeds are eaten by birds.

Environmental and economic benefits

Source of income. Grazed by livestock and wild game. Insect repellent.

Nutritional composition

LEAVES

Energy (kcal)	44
Calcium (mg)	268
Water (g)	85.6
Iron (mg)	6.9
Protein (g)	4.8
Zinc (mg)	0.75
Fat (g)	0.9
Vitamin A (RE) (µg)	532
Carbohydrates avail. (g)	1.9
Folate (µg)	350
Dietary fibre (g)	4.3

Source: FAO/INFOODS Food Composition Table for western Africa, 2019 (food code: 04_072)

Traditional culinary art

Leaves and shoots are boiled or used to prepare soup. Leaves, young shoots and occasionally flowers are eaten boiled as a potherb, relish, stew or side dish. Leaves mixed with those of Ethiopian mustard (*Brassica carinata*) are boiled, made into lumps, dried in the sun and stored in a clay pot (agulu) as a dry-season food.

Value-added processing technologies and products

Leaves dried and stored for future use. Used as weaning food.

Potential for use as livestock feed

Grazed by camels, cattle, sheep and goats. Cake resulting from oil extraction could be fed to livestock.

Potential for use as an industrial raw material

Leaves dried and ground into flour. Oil extracted from seeds.


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COMMON NAME

African star apple

SCIENTIFIC NAME

Chrysophyllum albidum

Agroecological diversity

A tropical fruit tree found in tropical Africa. It grows well in deep, rich earth, clayey loam or sandy soil. Altitudes around 425 m.

Agronomic and edaphic requirements

Propagated from seeds , cuttings or grafting. Bears fruits in 5–10 years. Attacked by insects and diseases such as phomopsis.

Environmental and economic benefits

Wood for construction. Latex used as a substitute for wax.

Nutritional composition

FRUITS

Energy (kcal)	132
Calcium (mg)	24
Water (g)	70.7
Iron (mg)	1.5
Protein (g)	3.4
Zinc (mg)	0.98
Fat (g)	5.2
Vitamin A (RE) (µg)	1
Carbohydrates avail. (g)	16.4
Folate (µg)	-
Dietary fibre, total (g)	3.1

Source: FAO/INFOODS Food Composition Table for Western Africa, 2019 (food code: 05_053)

Traditional culinary art

Eaten fresh or as fruit salad or dessert.

Value-added processing technologies and products

Fruit juice and jam.

Potential for use as livestock feed

Byproduct used as animal feed.

Potential for use as an industrial raw material

Juice.


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COMMON NAME

African winged bean

SCIENTIFIC NAME

Psophocarpus scandens

Agroecological diversity

A climbing tropical plant that that prefers lowland swampy localities, periodically flooded forests and riverbanks. It also occurs in drier localities such as grassland, thickets and fallow land. It thrives in full sunlight but also tolerates some shade. Annual rainfall of 1200–1800mm and a mean annual temperature of 25°C.

Agronomic and edaphic requirements

Propagated from seeds, which are pre-soaked for 12–24 hours before planting. When grown on flat land, a distance of 50 × 50cm is adequate. When allowed to climb fences, trellises or shrubs, one or two seeds are placed near the base of the support. Flowering starts about 115 days after sowing. The plant is resistant to several diseases and pests including false rust and dark leaf spot. It is also resistant to necrotic mosaic virus and flower blight. In Mauritius and Indonesia it is susceptible to nematode attack. In the Democratic Republic of the Congo, bruchid weevils attack the seed.

Environmental and economic benefits

Extraction of tannins. The plants fix atmospheric nitrogen to the soil. Grown as a cover crop and green manure in Africa and Asia.

Traditional culinary art

Leaves, pods, sprouts and seeds are edible. Leaves are eaten as a vegetable. Leaves and young sprouts are cooked and eaten as a potherb.

Value-added processing technologies and products

Seeds can be roasted and ground into flour.

Potential for use as livestock feed

Leaves used as fodder.

Potential for use as an industrial raw material

Seed flour.


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COMMON NAME

African yam bean

SCIENTIFIC NAME

Sphenostylis stenocarpa

Agroecological diversity

A tropical climbing annual that grows prostrate or erect and approximately 1–3m tall. Altitudes up to 1800m. Grows in marshy arid places with daytime temperatures of 15–35°C. Requires fertile, sandy soil of pH 5.5–6.0.

Agronomic and edaphic requirements

Propagated from seeds.

Environmental and economic benefits

Source of income for farmers. Animal feed.

Nutritional composition

DRY SEEDS

Energy (kcal)	316
Calcium (mg)	40
Water (g)	11.4
Iron (mg)	4.1
Protein (g)	20.5
Zinc (mg)	2.0
Fat (g)	1.5
Vitamin A (RE) (µg)	-
Carbohydrates avail. (g)	46.7
Folate (µg)	-
Dietary fibre (g)	16.7

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 03_010)

Traditional culinary art

Seeds are roasted and have nutty flavour. Boiled with maize or ground into flour. Immature seeds and stems are cooked as a vegetable or in soups. Tubers are boiled, baked or roasted.

Value added processing technologies and products

Ground into flour and used in baked products.

Potential for use as livestock feed

Livestock feed and for fattening pigs.

Potential for use as an industrial raw material

Roasted and used as a coffee substitute. Flour used in baked products.


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COMMON NAME

Alligator pepper

SCIENTIFIC NAME

Afromomum melegueta

Agroecological diversity

Alligator pepper is a tropical perennial crop belonging to the family *Zingiberaceae*, the same family as ginger. It is native to the west African forest area around the coast.

Agronomic and edaphic requirements

This shade-loving shrub is usually planted with its rhizome and can be planted at 2 × 2 m spacing in plantations and in semi-shady areas. It should also be planted in soil that is well drained but which has access to water. Weeding and pruning of excess plants should also be done regularly.

Environmental and economic benefits

Ornamental. Source of income.

Traditional culinary art

The seed are used to flavour vegetables, soups and fish dishes.

Value-added processing technologies and products

Dried and ground to powder.

Potential for use as an industrial raw material

The seeds are processed as spice. Flavouring for vinegar.


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COMMON NAME

Amaranth

SCIENTIFIC NAME

Amaranthus spp

Agroecological diversity

A herbaceous perennial plant cultivated in North America, Mexico, Central America, Asia, and across agroecologies in Africa. It requires a cool, highly moist environment (rainfall 500–1200mm) in medium to high altitude areas (0–2400m). It is disease resistant.

Agronomic and edaphic requirements

Propagated from seeds. Grows in a variety of soils high in nitrogen, phosphorus and organic matter. Is attacked by aphids and spider mites.

Environmental and economic benefits

Source of income for farmers. Ornamental. Oil extracted is used as a dietary supplement or in cosmetics.

Nutritional composition

LEAVES

Energy (kcal)	40
Calcium (mg)	368
Water (g)	85.6
Iron (mg)	7.2
Protein (g)	4.1
Zinc (mg)	0.66
Fat (g)	0.4
Vitamin A (RE) (µg)	452
Carbohydrates avail. (g)	3.1
Folate (µg)	76
Dietary fibre (g)	3.8

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 04_023)

Traditional culinary art

Cooked as a vegetable.

Value added processing technologies and products

Leaves can be used to make fermented products.

Potential for use as livestock feed

Fodder for livestock.

Potential for use as an industrial raw material

Dry leaves used to make sauces.


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COMMON NAME

Avocado

SCIENTIFIC NAME

Persea americana

Agroecological diversity

A tropical or subtropical fruit. Ideal altitude 1200–2200m, rainfall 1000–1200mm, temperature range 25–30°C and soil pH range 5–7. May be intercropped with other crops such as beans, peas, kale or cabbage during the first 3–5 years.

Agronomic and edaphic requirements

Requires deep, fertile, aerated soil, particularly sandy or alluvial loam. Propagated by seed and grafting. Layering spaced at 9 × 9m. Produces fruit after 3–5 years. Pests include thrips, scale and fruit flies. Diseases include root rot, anthracnose and scab.

Environmental and economic benefits

Source of income for farmers. Tree used for timber or firewood.

Nutritional composition

FRUITS

Energy (kcal)	191
Calcium (mg)	19
Water (g)	74.0
Iron (mg)	1.0
Protein (g)	1.6
Zinc (mg)	0.39
Fat (g)	19.6
Vitamin A (RE) (µg)	5
Carbohydrates avail. (g)	0
Folate (µg)	67
Dietary fibre (g)	4.0

Source: Kenya food composition tables, 2018 (food code: 05003)

Traditional culinary art

Avocado oil used for salads. Vegetarian cuisine. Served raw or made into avocado soup.

Value added processing technologies and products

Avocado ready-to-drink juice. Smoothies.

Potential for use as an industrial raw material

Extraction of avocado oil.


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COMMON NAME

Balsam apple

SCIENTIFIC NAME

Momordica balsamina

Agroecological diversity

A perennial climbing plant found at elevations from sea level to 1465 m. Dry to wet areas with rainfall 200–1200 mm.

Agronomic and edaphic requirements

Propagated by seed. Grows well in loam, clay, alluvial, gravelly, and calcareous soils. It requires a soil rich in organic matter if optimum yields are to be achieved. The fruit is eaten by birds, ants and some mammals.

Environmental and economic benefits

Leaf sap is used to clean metal objects and the fruit is used as a soap substitute for hand washing.

Traditional culinary art

Leaves and young fruit are cooked and eaten as vegetables. They can also be pickled or cooked in soups. Immature fruits can be used in sauces and soups as a vegetable.

Value-added processing technologies and products

Fruits are used as a soap substitute.

Potential for use as livestock feed

Leaves and stems have been used to feed camels, goats and sheep.


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COMMON NAME

Bambara groundnut

SCIENTIFIC NAME

Vigna subterranea

Agroecological diversity

A nutritionally rich grain legume able to tolerate drought and poor soils. Optimum annual rainfall is 400–750mm and temperature range is 19–30°C. Well-drained sandy and sand loam soils with pH around 5–6.

Agronomic and edaphic requirements

Propagated by seeds. Can withstand high temperatures and dry conditions. Bambara seeds are available year-round. The plants can be harvested for the seeds four months after sowing. The dried seeds can keep indefinitely in a cool, dry place.

Environmental and economic benefits

Fixes nitrogen into the soil. Source of income for farmers and food for wild animals.

Nutritional composition

NUTS

Energy (kcal)	323
Calcium (mg)	53
Water (g)	9
Iron (mg)	3.2
Protein (g)	19.5
Zinc (mg)	2.4
Fat (g)	5.9
Vitamin A (RE) (µg)	tr
Carbohydrates avail. (g)	33.6
Folate (µg)	100
Dietary fibre (g)	28.9

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 03_001)

Traditional culinary art

Consumed as a snack food after roasting or boiling. Ground into flour and used to prepare porridge. The flour is also used as a thickener in soups. Seeds can be cooked as a meal.

Value-added processing technologies and products

Seeds roasted and ground into flour.

Potential for use as livestock feed

Byproducts used in animal feed.

Potential for use as an industrial raw material

Groundnut flour is used in a number of products including snacks and pastries, breakfast cereal, pasta, traditional foods, composite flour, complementary food, milk and yoghurt. Can be canned.


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COMMON NAME

Baobab

SCIENTIFIC NAME

Adansonia digitata

Agroecological diversity

A tree native to the Africa savannah region. It grows well in areas with annual rainfall of 200–1200mm, altitude below 600–1500m and temperature of 20–42°C. It prefers heavy clay soils.

Agronomic and edaphic requirements

Flourishes in poor soils. Soil must be well-drained and sandy. Heat tolerant, with the ability to store large amounts of water, making them drought resistant. Propagated using seeds or cuttings. Moderate water requirements. Fertilizer is not required. Common pests are mealybugs, spider mites and fungus gnats. Can live up to 1000 years.

Environmental and economic benefits

Used by animals for shelter. Ornamental. Used as a landmark.

Nutritional composition

FRUITS

Energy (kcal)	305
Calcium (mg)	254
Water (g)	16.2
Iron (mg)	6.4
Protein (g)	2.1
Zinc (mg)	1.44
Fat (g)	0.3
Vitamin A (RE) (µg)	12
Carbohydrates avail. (g)	70.0
Folate (µg)	50
Crude fibre (g)	7.0

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 05_004)

Traditional culinary art

Fruits eaten with milk or milk porridge or eaten as a snack.

Value added processing technologies and products

Fruits ground into flour. Prepared fruit juice.

Potential for use as livestock feed

Foliage for livestock.

Potential for use as an industrial raw material

Fruit juice.


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COMMON NAME

Barbados cherry

SCIENTIFIC NAME

Malpighia glabra

Agroecological diversity

Barbados cherry grows well in hot, tropical, lowland areas with medium to high rainfall. Rocky limestone. Elevation between 800–1700m and temperature range of 24–34°C. Prefers a rich, deep, and well-drained soil with a pH range of 5.5–7.5.

Agronomic and edaphic requirements

Trees produce after 3–4 years. Propagated as seeds, cuttings, layering and grafting.

Environmental and economic benefits

Metal polish, wood, shade.

Nutritional composition

FRUITS

Energy (kcal)	36
Calcium (mg)	11
Water (g)	89.9
Iron (mg)	0.5
Protein (g)	0.7
Zinc (mg)	0.50
Fat (g)	0.1
Vitamin A (RE) (µg)	62
Carbohydrates avail. (g)	7.1
Folate (µg)	45
Dietary fibre (g)	1.9

Source: The standard tables of food composition in Japan, 2015 (food code: 07003)

Traditional culinary art

Fruit is eaten raw, cooked or stewed.

Value added processing technologies and products

Made into juices, sauces, jellies, jam and wine.

Potential for use as an industrial raw material

Juice and jam.

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COMMON NAME

Bell pepper (sweet pepper)

SCIENTIFIC NAME

Capsicum annuum

Agroecological diversity

Bell pepper grows well from sea level up to 2000m. It requires annual rainfall of 600–1200mm, a temperature range of 18–30°C and well-drained loamy soils rich in organic matter with pH of 5.5–6.8.

Agronomic and edaphic requirements

A warm-season crop that takes two to three months from transplanting to harvesting. It is propagated using seeds with spacing of 60cm between rows and 30cm between plants. Common pests include liriomyza, tetranychus and thrips. Diseases include grey moulds, early blight, leaf spot, late blight, anthracnose, downy mildew and powdery mildew.

Environmental and economic benefits

Source of income for farmers. Ornamental.

Nutritional composition

FRUITS

Energy (kcal)	85
Calcium (mg)	19
Water (g)	93.4
Iron (mg)	0.7
Protein (g)	1.4
Zinc (mg)	0.29
Fat (g)	0.4
Vitamin A (RE) (µg)	28
Carbohydrates avail. (g)	17.8
Folate (µg)	-
Dietary fibre (g)	2.2

Source: Indian food composition tables, 2017 (food code: D035)

Traditional culinary art

Raw in salads. Marinated and tossed into pasta. Cooked and served with rice.

Potential for use as livestock feed

Used as forage.

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COMMON NAME

Bitter-berry

SCIENTIFIC NAME

Prunus virginiana

Agroecological diversity

Bitter-berry is cultivated in open woodland gardens. It performs best in full sun with well-drained soil. Drought tolerant.

Agronomic and edaphic requirements

Propagated by seeds. Susceptible to aphids, caterpillars, beetles, spidermites, black knot, leaf spot, powdery mildew, root rot and leaf curl.

Traditional culinary art

Fruits used to make jam, jellies, syrup, pie fillings and wines. Fruits can be sun dried. Fruit also used to flavour soups and stews or as a thickening agent. Cakes and pies. Bark used to brew tea.

Value-added processing technologies and products

Fruits make jam, jellies, syrup, pie fillings and wines.

Potential for use as livestock feed

Leaves and fruit stones are toxic to animals.

Potential for use as an industrial raw material

Fruits sun dried or made into wine, jam, jellies and syrup.


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COMMON NAME

Bitter kola

SCIENTIFIC NAME

Garcinia kola

Agroecological diversity

A flowering plant growing in moist rain forests and lowland plains areas to an altitude of 300m. Annual rainfall of 2500mm and temperature range of 21–32°C.

Environmental and economic benefits

Source of income to farmers. Leaves used for bedding materials.

Nutritional composition

FRUITS

Energy (kcal)	48
Calcium (mg)	-
Water (g)	88.1
Iron (mg)	-
Protein (g)	1.1
Zinc (mg)	-
Fat (g)	0.4
Vitamin A (RE) (µg)	-
Carbohydrates avail. (g)	9.6
Folate (µg)	-
Crude fibre (g)	0.5

Source: Priority food tree and crop food composition database, 2019 (food code: F0068)

Traditional culinary art

Cooked or dried.

Value added processing technologies and products

Fruits are dried and ground to a powder before use.

Potential for use as an industrial raw material

Used in brewing.


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COMMON NAME

Bitter leaf

SCIENTIFIC NAME

Vernonia amygdalina

Agroecological diversity

A tropical plant that grows well in a shaded environment.

Agronomic and edaphic requirements

Grows well in loamy soil. Propagated from stem cuttings of mature plants in humus-rich soil. It requires organic fertilizer such as chicken manure, which can be applied at the rate of 2 tons per hectare, once a month. Pests include weevils, thrips, aphids, ants, whiteflies, snails and mealybugs.

Environmental and economic benefits

Source of income for farmers. Ornament. Wood ash to control seed-borne fungi.

Nutritional composition

LEAVES

Energy (kcal)	65
Calcium (mg)	170
Water (g)	80.3
Iron (mg)	2.1
Protein (g)	5
Zinc (mg)	1.88
Fat (g)	0.9
Vitamin A (RE) (µg)	483
Carbohydrates avail. (g)	6.7
Folate (µg)	87
Dietary fibre (g)	5.1

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 04_022)

Traditional culinary art

Leaves used in soup or cooked as vegetables.

Value added processing technologies and products

Dried for future use.

Potential for use as livestock feed

Used as forage.

Potential for use as an industrial raw material

Dried for use as vegetables.


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COMMON NAME

Black bean

SCIENTIFIC NAME

Phaseolus vulgaris

Agroecological diversity

Black bean prefers well-drained, loamy soils with pH ranging from 5.5 to 7.0 and annual temperature in the range of 15–30°C. Rainfall of 300–600mm and altitudes above 1000m.

Agronomic and edaphic requirements

Propagated by seeds.

Environmental and economic benefits

Grown for home consumption and income. Nitrogen-fixing crop.

Nutritional composition

DRY SEEDS

Energy (kcal)	306
Calcium (mg)	105
Water (g)	11.4
Iron (mg)	6.6
Protein (g)	22.2
Zinc (mg)	2.82
Fat (g)	1.80
Vitamin A (RE) (µg)	-
Carbohydrates avail. (g)	39.7
Folate (µg)	440
Dietary fibre (g)	21.1

Source: FAO/INFOODS global food composition database for pulses, 2017 (food code: PHV002)

Traditional culinary art

Boiled then fried for use in stews. Leaves cooked as vegetables.

Value added processing technologies and products

Seeds dried and ground into flour.

Potential for use as livestock feed

Leaves used as livestock feed.

Potential for use as an industrial raw material

Dried, packed and sold.

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COMMON NAME

Blueberry

SCIENTIFIC NAME

Vaccinium sect

Agroecological diversity

The blueberry is a perennial flowering shrub with blue or purple berries. It is cultivated in north America, Canada, Asia and Africa, preferably in acidic soil between pH 4.2 and 5.2.

Agronomic and edaphic requirements

Propagated from seeds. Spacing of 0.9–1.2m between plants and 1.8–2.8m between rows. Pests include bollworms, aphids, thrips, weevils, beetles, grasshoppers, locusts and a few bird species.

Environmental and economic benefits

Source of income.

Traditional culinary art

Berries eaten fresh, blended into juice or eaten as a dessert.

Value-added processing technologies and products

Jam, jellies, wine.

Potential for use as livestock feed

Leaves used as animal feed.

Potential for use as an industrial raw material

Jam, juice, jelly, wine.


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COMMON NAME

Bologi (worow)

SCIENTIFIC NAME

Crassocephalum biafrae

Agroecological diversity

A perennial climber with edible vines and leaves. The vine strands can grow up to 2m high. Bologi grows in semi-shade in moist lowland tropics up to an altitude of around 1300m and with around 1500mm of rain per year.

Agronomic and edaphic requirements

Bologi can be propagated from seeds or cuttings. It thrives in well-drained (sandy), loamy and clay soils with a mildly acidic, neutral or slightly alkaline pH range. It grows best in fertile soil rich in organic matter. When planted from seeds or vines, it produced copious leaves for harvest after about 70 days and continues for one year or more. Harvesting can happen all year round if the flowering stems are removed to discourage the dispersion of assimilate to fruit production rather than vines.

Environmental and economic benefits

It is a source of food forest and tree plantations, especially in cocoa plantations. It provides good soil cover in plantations to conserve moisture and create a good micro climate for microbial activities.

Traditional culinary art

Spinach-like leaves are eaten steamed. Leaves are also used as a substitute for tea.

Value-added processing technologies and products

Juice, wine, pickles, jam.

Potential for use as livestock feed

Leaves dried for future use.

Potential for use as an industrial raw material

Leaves used for forage.


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COMMON NAME

Breadfruit

SCIENTIFIC NAME

Artocarpus altilis

Agroecological diversity

A tropical plant that grows well at altitudes of 0–1500m. Requires deep, fertile, well-drained soils or shallow sandy soils. Soil pH 6.1–7.4.

Agronomic and edaphic requirements

Propagated by seeds, sucker or root cuttings.

Environmental and economic benefits

Building structures and small canoes. Carved into statues. Firewood. Bark cloth. Leaves used to wrap food. Latex used for adhesives and gum.

Nutritional composition

FRUITS

Energy (kcal)	96
Calcium (mg)	29
Water (g)	71.3
Iron (mg)	2.5
Protein (g)	1.4
Zinc (mg)	0.15
Fat (g)	0.3
Vitamin A (RE) (µg)	2
Carbohydrates avail. (g)	17.8
Folate (µg)	14
Dietary fibre (g)	8.3

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 05_005)

Traditional culinary art

Fruit rolls, porridge, sauce, flour. Fruit eaten raw or cooked.

Value added processing technologies and products

Fruit leather, preserves, marmalade, juice, jam. Seeds can be dried for future use. Fruit dried and ground into flour to make bread, cakes and cookies.

Potential for use as livestock feed

Leaves used as livestock fodder.

Potential for use as an industrial raw material

Juice, jam.


©World Agroforestry/Julius Atia

COMMON NAME

Bush mango

SCIENTIFIC NAME

Irvingia gabonensis

Agroecological diversity

Bush mango grows in the tropical regions of west and central Africa. It requires fairly wet, well-drained loamy-to-clay soils and an average annual rainfall of around 2400 mm.

Agronomic and edaphic requirements

Propagated vegetatively by grafting, budding, air layering and cuttings.

Environmental and economic benefits

Wood for construction. Trees are ornamental and create shade. The fruits provide food and source of income for farmers.

Traditional culinary art

Fruits eaten fresh. Seeds ground into a paste used to thicken soup and stew and to make sauces. Used as flavouring.

Value-added processing technologies and products

Seeds dried and stored for future use. Oil is extracted from seeds and used for cooking. The fruits can be made into juice, sweet wine, jam and jelly.

Potential for use as livestock feed

Byproducts used in animal feed.

Potential for use as an industrial raw material

Seed oil is used to make margarine, soap, pharmaceuticals, cosmetics and candles. Juice and wine are produced from the fruit pulp.

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COMMON NAME

Cape gooseberry

SCIENTIFIC NAME

Physalis peruviana

Agroecological diversity

Gooseberry grows in well-drained loam or sandy soils of pH 5.5–6. Often intercropped with other commodities.

Agronomic and edaphic requirements

Propagated by seed. Spaced 90–120cm by 152–182cm. Takes 4–6 weeks to flower, 70–80 days to mature. Harvesting season of 3–4 months.

Environmental and economic benefits

Source of income for farmers.

Traditional culinary art

Eaten raw, added to desserts, juiced and used to flavour beverages. Added to salads and made into raisins and candies.

Value-added processing technologies and products

Juice, wine and jam.

Potential for use as livestock feed

Fodder for animals.

Potential for use as an industrial raw material

Juice, jam, flavouring

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COMMON NAME

Cassava

SCIENTIFIC NAME

Manihot esculenta

Agroecological diversity

Cassava grows in sub-Saharan African countries and semi-arid areas below 1000m above sea level. It performs well in drought-prone areas and on poor soils. It prefers well-drained, sandy clay loam with a pH between 5.5 and 6.5. It does not tolerate waterlogging. Cassava requires temperatures between 25°C and 32°C for proper growth. It is planted in full sun and is very sensitive to shading. Harvested by digging.

Agronomic and edaphic requirements

Propagated from cuttings. Fertilizer application increases yields. Harvested 8–24 months after planting. Diseases include anthracnose, cassava brown leaf spot, white leaf spot, brown streak, cassava mosaic and bacterial blight.

Nutritional composition

TUBERS

Energy (kcal)	142
Calcium (mg)	37
Water (g)	62.1
Iron (mg)	1.5
Protein (g)	1.3
Zinc (mg)	2.05
Fat (g)	0.3
Vitamin A (RE) (µg)	4
Carbohydrates avail. (g)	31.6
Folate (µg)	24
Dietary fibre (g)	3.7

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 02_001)

LEAVES

Energy (kcal)	93
Calcium (mg)	298
Water (g)	72.1
Iron (mg)	5.5
Protein (g)	7.6
Zinc (mg)	1.29
Fat (g)	1.1
Vitamin A (RE) (µg)	573
Carbohydrates avail. (g)	9.2
Folate (µg)	120
Dietary fibre (g)	7.9

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 04_008)

Traditional culinary art

Leaves are fried and eaten as vegetables. Tuber is consumed fresh, dried or cooked.

Value added processing technologies and products

Dry tubers are ground into flour for baking products (biscuits, bread, chapatis, cookies).

Potential for use as livestock feed

Used as animal feed.

Potential for use as an industrial raw material

Flour used to produce baked products. Production of starch, alcohol and glue.


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COMMON NAME

Ceylon spinach (Malabar spinach)

SCIENTIFIC NAME

Basella alba

Agroecological diversity

An edible perennial vine found in tropical Asia and Africa. It grows well in full sunlight in hot, humid climates and in areas lower than 500m above sea level. It grows best in sandy loam soils rich in organic matter with a pH ranging from 5.5 to 8.0.

Agronomic and edaphic requirements

It is propagated from seeds and harvested after 4–6 weeks. It is resistant to pests and diseases.

Environmental and economic benefits

Source of income to farmers. Flowers and seeds used as a natural dye.

Nutritional composition

LEAVES

Energy (kcal)	28
Calcium (mg)	267
Water (g)	90.4
Iron (mg)	10.9
Protein (g)	3.4
Zinc (mg)	0.5
Fat (g)	0.7
Vitamin A (RE) (µg)	368
Carbohydrates avail. (g)	0.2
Folate (µg)	71
Dietary fibre (g)	3.7

Source: Kenya food composition tables, 2018 (food code: 04038)

Traditional culinary art

Used as a leafy vegetable. Infusion of the leaves is a tea substitute. Cooked with sardines, onions, garlic and parsley. Cooked with red pumpkin. Cooked with fish and shrimp. Consumed as fruit sap.

Value added processing technologies and products

Fruit sap used in the colouring of pastries.

Potential for use as livestock feed

Forage for livestock.

Potential for use as an industrial raw material

Fruit used to make fruit juice.


©FAO/Olivier Thuillier

COMMON NAME

Cherry tomato

SCIENTIFIC NAME

Solanum lycopersicum

Agroecological diversity

A type of small tomato that is harvested in the wild and also grown commercially. Cherry tomatoes require well-draining soil with a pH of 6.2 to 6.5 and temperature range of 19–30°C. They can be rotated with rice and legumes to avoid soil-born diseases.

Agronomic and edaphic requirements

Propagated from seeds. They take 20–30 days from sowing to planting. Broadcast or planted in rows 30 cm apart. Thinned after six weeks. They require four to six hours of sun each day. Sprinkle lime when planting. A little tomato fertilizer or well-rotted manure can be used. Remove small suckers where branches meet the stalk or at the bottom of the main stalk as they are attacked by bacterial wilt.

Nutritional composition

FRUITS

Energy (kcal)	31
Calcium (mg)	12
Water (g)	91
Iron (mg)	0.4
Protein (g)	1.1
Zinc (mg)	0.20
Fat (g)	0.1
Vitamin A (RE) (µg)	160
Carbohydrates avail. (g)	5.8
Folate (µg)	35
Dietary fibre (g)	1.4

Source: The standard tables of food composition in Japan, 2015 (food code: 06183)

Traditional culinary art

Eaten raw, cooked in stews or made into tomato juice.

Value-added processing technologies and products

Jam, juice.

Potential for use as livestock feed

Used as animal feed.

Potential for use as an industrial raw material

Tomato paste and tomato juice.


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COMMON NAME

Chestnut

SCIENTIFIC NAME

Castanea sativa

Agroecological diversity

A tree that favours a Mediterranean climate. Ideally planted on a gentle slope that allows cold air to drain to a lower area while aiding soil drainage. Grows best in well-drained, acid loam soils with a pH between 4.5 and 6.5. Full sunlight and open fields are preferred for maximum nut production.

Agronomic and edaphic requirements

Propagated by grafting onto a seedling rootstock; ready to receive a scion when they are 2 years old. A layer of mulch should be spread around the trunks to suppress weeds and conserve soil moisture. Pests include deer (which destroy the young seedlings), beetles and mealybug.

Environmental and economic benefits

Source of income for farmers.

Nutritional composition

NUTS

Energy (kcal)	174
Calcium (mg)	18
Water (g)	48.2
Iron (mg)	0.7
Protein (g)	3.4
Zinc (mg)	0.40
Fat (g)	0.2
Vitamin A (RE) (µg)	0
Carbohydrates avail. (g)	32.1
Folate (µg)	58
Dietary fibre (g)	14.9

Source: The Australian food composition database, release 1, 2019 (food code: F006095)

Traditional culinary art

Used in soups and desserts. Consumed after roasting.

Value added processing technologies and products

Processed to produce cream and purees.

Potential for use as livestock feed

Fed to pigs. Ingredient for cattle feed.

Potential for use as an industrial raw material

Nut creams and purees.


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COMMON NAME

Chia

SCIENTIFIC NAME

Salvia hispanica

Agroecological diversity

Chia is cultivated in Mexico, Chile and Africa. A herbaceous, hardy annual that likes full sun, well-drained soils and temperatures of around 20–25°C.

Agronomic and edaphic requirements

Propagated by seeds.

Environmental and economic benefits

Source of income.

Nutritional composition

DRY SEEDS

Energy (kcal)	443
Calcium (mg)	631
Water (g)	5.8
Iron (mg)	7.7
Protein (g)	16.5
Zinc (mg)	4.58
Fat (g)	30.7
Vitamin A (RE) (µg)	-
Carbohydrates avail. (g)	7.7
Folate (µg)	49
Dietary fibre (g)	34.4

Source: USDA national nutrient database for standard reference, Legacy database, 2019 (food code: 170554)

Traditional culinary art

Seeds are ground and used in baking, sprinkled over salads and in vegetable dishes.

Value-added processing technologies and products

Used in cookies and bread.

Potential for use as livestock feed

Livestock fodder.

Potential for use as an industrial raw material

Production of baked products. Oil extraction. Chia mucilage is used as a foam stabilizer, emulsifier or binder. Gum extraction.

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COMMON NAME

Cocoyam

SCIENTIFIC NAME

Xanthosoma sagittifolium

Agroecological diversity

A herbaceous perennial growing in tropic and subtropical regions. It thrives in soil with a pH of 4.2–7.5 and temperatures of 20–30°C.

Agronomic and edaphic requirements

Forms mature plants from corms within 14–20 weeks. Once established, mature plants can produce large amount of foliage in the first 6–9 months and may also produce up to ten or more corms within ten months. Grows best in fertile, well-draining, sandy loam soil. Propagated from headsetts or suckers.

Environmental and economic benefits

Source of income. Promotes food and nutrition security.

Nutritional composition

TUBERS

Energy (kcal)	136
Calcium (mg)	15
Water (g)	63.7
Iron (mg)	0.7
Protein (g)	3.3
Zinc (mg)	0.34
Fat (g)	0.3
Vitamin A (RE) (µg)	1
Carbohydrates avail. (g)	28.9
Folate (µg)	23
Dietary fibre (g)	2.0

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 02_005)

LEAVES

Energy (kcal)	39
Calcium (mg)	74
Water (g)	87.6
Iron (mg)	2.1
Protein (g)	3.5
Zinc (mg)	0.62
Fat (g)	0.7
Vitamin A (RE) (µg)	595
Carbohydrates avail. (g)	2.3
Folate (µg)	130
Dietary fibre (g)	4.5

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 04_009)

Traditional culinary art

Peeled and then baked, steamed, boiled or mashed. Fried as chips or cooked in curries. Leaves and petioles used as food and cooked like any other green vegetable.

Value added processing technologies and products

Tubers dried and ground into flour for baking products.

Potential for use as livestock feed

Used as fodder.

Potential for use as an industrial raw material

Tuber flour used in baked products.


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COMMON NAME

Coriander

SCIENTIFIC NAME

Coriandrum sativum

Agroecological diversity

Coriander grows well in dry and cool weather with a temperature range of 20–30°C. It does not tolerate frost. Prefers well-drained loamy soils with optimum pH range of 6 to 8.

Agronomic and edaphic requirements

Propagated from seeds. Soil should have fine tilth before planting. Spacing of 20 × 15cm. Seeds germinate after 1–2 weeks. Add top dressing of farmyard manure after one month. Diseases and pests include powdery mildew, wilt, grain mould. Pull out the plant when it is 30–35 days old.

Environmental and economic benefits

Ornamental.

Nutritional composition

LEAVES

Energy (kcal)	37
Calcium (mg)	146
Water (g)	87
Iron (mg)	5.3
Protein (g)	3.5
Zinc (mg)	0.68
Fat (g)	0.7
Vitamin A (RE) (µg)	635
Carbohydrates avail. (g)	1.9
Folate (µg)	-
Dietary fibre (g)	4.7

Source: Indian food composition tables, 2017 (food code: G009)

Traditional culinary art

Used as spice to flavour sausages and foods like chutneys and salads. Dried and used in pickles.

Value-added processing technologies and products

Dried leaves and seeds ground into powder.

Potential for use as an industrial raw material

Leaves and seeds dried and sold.


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COMMON NAME

Country potato

SCIENTIFIC NAME

Solenostemon rotundifolius

Agroecological diversity

Country potato is grown across Africa's tropical lowlands. It tolerates annual rainfall as low as 450mm. Altitudes around 2000m.

Agronomic and edaphic requirements

Propagated using tubers.

Environmental and economic benefits

Source of income for farmers.

Traditional culinary art

Tubers cooked as vegetables – boiled, baked or fried.

Value-added processing technologies and products

Dried and milled into flour. Used to make chips and baked products.

Potential for use as livestock feed

Used as fodder.

Potential for use as an industrial raw material

Production of flour and starch.


©FAO/Stefanie Glinski

COMMON NAME

Cowpea

SCIENTIFIC NAME

Vigna unguiculata

Agroecological diversity

Cowpeas are an annual crop growing at an altitude of around 1500m. Optimal annual rainfall is 600–1 000mm and temperature range is 18–38°C. Soil pH 5–7.

Environmental and economic benefits

The deep roots help stabilize the soil. Dense cover helps protect the ground and preserve moisture. Fixes atmospheric nitrogen.

Nutritional composition

DRY SEEDS

Energy (kcal)	331
Calcium (mg)	75
Water (g)	10.7
Iron (mg)	6.7
Protein (g)	23
Zinc (mg)	3.77
Fat (g)	1.8
Vitamin A (RE) (µg)	1
Carbohydrates avail. (g)	50.3
Folate (µg)	420
Dietary fibre (g)	10.6

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 03_006)

Traditional culinary art

Seeds-boiled, steamed or fried to make sauce. Ground into flour and blended with many dishes. Pods and seeds fried or boiled as vegetables. Roasted, ground and served as a coffee substitute.

Value-added processing technologies and products

As a flour to thicken and flavour cereal products.

Potential for use as livestock feed

Crop makes hay and fodder.

Potential for use as an industrial raw material

Can be canned.


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COMMON NAME

Cucumber

SCIENTIFIC NAME

Cucumis sativus

Agroecological diversity

Warm climate with optimal temperature range of about 18–30°C. Requires fertile and well-drained soil with a pH of 6.5–7.5.

Agronomic and edaphic requirements

Propagated by seeds.

Nutritional composition

FRUITS

Energy (kcal)	11
Calcium (mg)	20
Water (g)	96.2
Iron (mg)	0.7
Protein (g)	0.6
Zinc (mg)	0.18
Fat (g)	0.1
Vitamin A (RE) (µg)	1
Carbohydrates avail. (g)	1.2
Folate (µg)	7
Dietary fibre (g)	1.4

Source: Kenya food composition tables, 2018 (food code: 04016)

Traditional culinary art

Eaten fresh, often in salads. Or served with vinegar.

Value added processing technologies and products

Pickled cucumber.


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COMMON NAME

Cumin

SCIENTIFIC NAME

Cuminucum cyminum

Agroecological diversity

A drought-tolerant tropical or subtropical herb grown for its aromatic and medicinal seeds. Optimum growth temperature of 25–30°C and soil pH of 6.8–8.3.

Agronomic and edaphic requirements

Growth season of 100 to 120 days. It requires fertile sandy or loamy soil with good aeration and drainage.

Environmental and economic benefits

Source of income for farmers from sales of seeds.

Traditional culinary art

Seeds ground to powder and used as spice on its own or in blends such as adobos, sofrito, garam masala and curry powder.

Value-added processing technologies and products

Seeds ground into a powder for later use. Oil extracted from seeds.

Potential for use as livestock feed

Packaged spices. Essential oil.


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COMMON NAME

Custard Apple

SCIENTIFIC NAME

Annona reticulata

Agronomic and edaphic requirements

Bears fruits after 3–4 years. Grows best in moist soil during fruit set and development. Requires manure, fertilizer, training and pruning.

Environmental and economic benefits

Source of income for farmers.

Nutritional composition

FRUITS

Energy (kcal)	108
Calcium (mg)	30
Water (g)	71.5
Iron (mg)	0.7
Protein (g)	1.7
Zinc (mg)	-
Fat (g)	0.6
Vitamin A (RE) (µg)	4
Carbohydrates avail. (g)	22.8
Folate (µg)	-
Dietary fibre (g)	2.4

Source: USDA national nutrient database for standard reference, Legacy database, 2019 (food code: 171725)

Traditional culinary art

It is served raw and fresh. Used as seasonings or dressings.

Value added processing technologies and products

Wine, jam, juice.

Potential for use as an industrial raw material

Yields blue/black dye.

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COMMON NAME

Dandelion

SCIENTIFIC NAME

Taraxacum officinale

Agroecological diversity

Dandelion is a perennial plant that grows best in moist areas in full sun. It can also survive under shade and dry conditions.

Agronomic and edaphic requirements

Buds grow from the uppermost area of the root, producing a crown that can regenerate new plants even when the plant is cut off at or below the soil surface. Propagated by seeds. Stems are very short and wholly underground, producing a rosette of leaves at the ground surface. One head contains from 100 to 300 flowers which are produced all year round.

Environmental and economic benefits

Ornamental plantings, pastures, tree and vine crops.

Nutritional composition

GREENS

Energy (kcal)	47
Calcium (mg)	187
Water (g)	85.1
Iron (mg)	3.1
Protein (g)	2.7
Zinc (mg)	0.41
Fat (g)	0.7
Vitamin A (RE) (µg)	1016
Carbohydrates avail. (g)	5.7
Folate (µg)	27
Dietary fibre (g)	3.5

Source: USDA national nutrient database for standard reference, Legacy database, 2019 (food code: 169226)

Traditional culinary art

Leaves cooked or eaten raw in salad or in soups. Roots used to make coffee substitute.

Value-added processing technologies and products

Leaves and flowers are often used to make salads, beer and wine.

Potential for use as livestock feed

Used in poultry and animal feed.

Potential for use as livestock feed

Used to make coffee substitute.


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COMMON NAME

Dragon fruit

SCIENTIFIC NAME

Hylocereus spp

Agroecological diversity

Dragon fruit grows in arid and semi-arid regions.

Agronomic and edaphic requirements

It grows for about 20 years. Propagated as cuttings which take about 14 months to flower. Flowers bloom for a day. Requires fertilizer to flourish. Regular irrigation. Attacked by a few pests.

Environmental and economic benefits

Source of income.

Nutritional composition

FRUITS

Energy (kcal)	52
Calcium (mg)	6
Water (g)	85.7
Iron (mg)	0.3
Protein (g)	1.4
Zinc (mg)	0.30
Fat (g)	0.3
Vitamin A (RE) (µg)	0
Carbohydrates avail. (g)	9.9
Folate (µg)	44
Dietary fibre (g)	1.9

Source: The standard tables of food composition in Japan, 2015 (food code: 07111)

Traditional culinary art

Fruit eaten fresh, in fruit salads, or made into juice. Flowers consumed as a vegetable. Food colour.

Value added processing technologies and products

Fruit juice and jam.

Potential for use as livestock feed

Peels used as raw material for making animal feed.

Potential for use as an industrial raw material

Fruit processed into juice.


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COMMON NAME

Egusi (melon)

SCIENTIFIC NAME

Citrullus colocynthis

Agroecological diversity

Egusi is cultivated in west Africa, Europe and the United States of America. It is a subspecies of water melon (*Citrullus lunatus*) but does not have the same sweet, red flesh. It is rather grown for its seeds which are rich in oil, protein and carbohydrates. It thrives in impoverished sites, forest clearings, and in semi-arid subtropical and tropical zones up to around 1500 m above sea level. Low rainfall in the range 250–500 mm is sufficient. It tolerates both acidity and alkalinity (up to pH 8.0), though the optimal range is 5.5–7.0. Egusi is grown as a mixed crop, for example, on ridges between sorghum.

Agronomic and edaphic requirements

Grown from seed. Spacing of 3 m between plants. It takes at 6–8 months from sowing to harvest. Harvesting happens once the vines have dried and the fruits have changed colour. Egusi is largely free of pests and diseases.

Environmental and economic benefits

Source of income for farmers. Covers fields, suppresses weeds and controls soil erosion.

Traditional culinary art

The seeds are ground into a course flower and used as thickener in stews and soups. They can also be made into dumplings or used as a meat substitute. The seeds can be eaten whole or popped like popcorn. Oil extracted from the seeds is used as a salad oil.

Value-added processing technologies and products

Ground into flour for fortification of processed products.

Potential for use as livestock feed

Shells obtained during the oil extraction can be used as poultry litter. The leaves and the gourds can also serve as livestock fodder.

Potential for use as an industrial raw material

Seed flour is used as a thickener, stabilizer and fortifier of processed products. Seed oil.


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COMMON NAME

Enset

SCIENTIFIC NAME

Ensete ventricosum

Agroecological diversity

A herbaceous flowering plant in the banana family. Enset is cultivated in the tropical regions of Africa with rainfall of 1100–1500mm, altitude of 1100–3000m and optimal temperature 18–28°C. It favours moderately acidic to slightly alkaline soils (pH 5.6 –7.3).

Agronomic and edaphic requirements

Propagated vegetatively through corms or corm pieces which originate from field-grown mother plants. Spacing of at least 3 × 1.5m is advised. One plant can expect to yield 31kg after 2.5 years. A larger spacing of 3 × 2.5m achieves a higher yield per plant (41kg per plant).

Environmental and economic benefits

Ornamental. Used as a shelter against wind and sun by humans and animals. Fibre from the stem is used to make tea bags.

Traditional culinary art

The fermented stem and corm are used to make porridge and bread.

Value-added processing technologies and products

Dried to make starch which is used in various products.

Potential for use as livestock feed

The leaves and dried stems have potential for livestock feed.

Potential for use as an industrial raw material

Production of starch.


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COMMON NAME

Finger millet

SCIENTIFIC NAME

Eleusine coracana

Agroecological diversity

Finger millet is found in east Africa, southern Africa, the lake region of Kenya and India. Arid and semi-arid tropical zones up to 2400 m altitude. Drought tolerant. It requires well drained fertile soils or sandy loam with pH 5–8 and well-distributed rainfall of 650–1000mm. Temperature range of 15–28°C.

Agronomic and edaphic requirements

A traditional crop planted by broadcasting tiny seeds. Early maturing. Harvested by cutting the heads. Then sun dried, threshed and winnowed. Can be stored for more than ten years. Susceptible to bird attack, chafer grubs, stem borers, shoot flies, midges, aphids and armyworms. Diseases include grain smut and head blast.

Environmental and economic benefits

The deep roots help stabilize the soil. Dense cover helps protect the ground and preserve moisture. Fixes atmospheric nitrogen.

Nutritional composition

DRY GRAINS

Energy (kcal)	305
Calcium (mg)	334
Water (g)	11.3
Iron (mg)	11.3
Protein (g)	7.4
Zinc (mg)	1.70
Fat (g)	1.9
Vitamin A (RE) (µg)	0
Carbohydrates avail. (g)	53.3
Folate (µg)	93
Dietary fibre (g)	22.6

Source: Kenya food composition tables, 2018 (food code: 01027)

Traditional culinary art

Grains ground into flour and used to make foods like porridge and ugali (stiff porridge).

Value added processing technologies and products

Flour and grains used in local beer brewing in western Kenya.

Potential for use as livestock feed

Seeds used in poultry feed. Stem and leaves fed to livestock.


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COMMON NAME

Garden huckleberry

SCIENTIFIC NAME

Solanum scabrum

Agroecological diversity

Garden huckleberry is a short-lived tropical perennial. It grows at elevations of around 2000m and temperatures of 20–30°C. Soil should be high in organic matter. Sandy loams to friable clay soils with a pH of 6.0–6.5.

Agronomic and edaphic requirements

Propagated by seed, preferably in moist soil. Seedlings are transplanted 4–5 weeks after planting; spacing between 15 × 15cm and 25 × 25cm. Regular daily irrigation is required for the first week after transplanting, then three times a week. Harvested five months after transplanting.

Pests include aphids, caterpillars, black beetles and snails. Diseases are late blight, downy mildew and powdery mildew.

Environmental and economic benefits

Source of income. Ornamental.

Nutritional composition

LEAVES

Energy (kcal)	30
Calcium (mg)	100
Water (g)	88.6
Iron (mg)	8.6
Protein (g)	3.8
Zinc (mg)	0.65
Fat (g)	0.1
Vitamin A (RE) (µg)	4
Carbohydrates avail. (g)	1.4
Folate (µg)	404
Dietary fibre (g)	4.3

Source: Kenya food composition tables, 2018 (food code: 04003)

Traditional culinary art

Fruits cooked and leaves added to soups.

Value-added processing technologies and products

Preserves, jams and pies.

Potential for use as livestock feed

Leaves are fed to livestock.

Potential for use as an industrial raw material

Production of analgesic ointments. Used in preserves, jams and pies.


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COMMON NAME

Gboma eggplant

SCIENTIFIC NAME

Solanum macrocarpon

Agroecological diversity

Gboma eggplant grows at altitudes around 1200 m and prefers a temperature range of 20–30°C. It requires moderately fertile, well-drained soils and rainfall of 500–1200mm.

Agronomic and edaphic requirements

Propagated by seeds. Flowering starts from 40 to 100 days. Spacing for leafy cultivars is 50 × 50cm and for fruit cultivars is 1 × 1m. Intercropped with maize and cassava. Responds well to NPK fertilizer and animal manure.

Diseases and pests include yellow rust, rust-brown leaf spot, powdery mildew, phomopsis rot, bacterial wilt, leaf beetle, army worm, fruit borer, root-knot nematode, cutworm and red spider mite.

Leaf harvest starts 6–9 weeks after transplanting, about a week after flowers have appeared.

Environmental and economic benefits

Source of income for farmers. Ornamental.

Nutritional composition

FRUITS

Energy (kcal)	32
Calcium (mg)	12
Water (g)	89.8
Iron (mg)	1.1
Protein (g)	1.3
Zinc (mg)	0.23
Fat (g)	0.4
Vitamin A (RE) (µg)	22
Carbohydrates avail. (g)	3.9
Folate (µg)	33
Dietary fibre (g)	4.0

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 04_074)

Traditional culinary art

Young leaves and young fruits are cooked and consumed as a vegetable. Leaves are eaten as a separate dish or in sauces, stir-fries, soups and salads. Eaten raw or pickled.

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COMMON NAME

Ginger

SCIENTIFIC NAME

Zingiber officinale

Agroecological diversity

Grows well in temperatures of 25–30°C. It prefers fertile, well-drained loamy soils with pH of 4.5–6.5 and altitudes of around 1500m.

Agronomic and edaphic requirements

It is propagated using rhizomes. Spacing may vary with soil type fertility, variety, climate and management. Ginger appears above ground days after planting but may be prolonged up to two months. Mulching is recommended. For healthy crop growth, add organic manure or fertilizer rich in potassium, calcium, magnesium, phosphorus, sulphur, chlorine, iron, boron, manganese, zinc, copper and molybdenum.

Ginger crops prefer light shade for good growth, though shade is not necessary. Diseases and pests include bacterial wilt, rhizome fly, rhizome scale, leaf roller, nematodes, shoot borer, leaf spot and white grub.

Environmental and economic benefits

Source of income for farmers.

Nutritional composition

ROOTS

Energy (kcal)	63
Calcium (mg)	19
Water (g)	81.3
Iron (mg)	1.9
Protein (g)	2.2
Zinc (mg)	0.39
Fat (g)	0.9
Vitamin A (RE) (µg)	15
Carbohydrates avail. (g)	8.9
Folate (µg)	11
Dietary fibre (g)	5.4

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 04_082)

Traditional culinary art

Spices, fresh paste, preservative. Used in pickles, chutney and curry paste. Green sprouts added to salads.

Value added processing technologies and products

Dried and ground into powder. Ginger tea (flavouring) and preserved slices.

Potential for use as livestock feed

Used as feed additive to stimulate the appetite and improve palatability.

Potential for use as an industrial raw material

Used as an ingredient in commercial products such as cookies, candy, teas, tinctures, sodas, jam, beer, capsules and syrup.

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COMMON NAME

Golden apple

SCIENTIFIC NAME

Spondias dulcis

Agroecological diversity

A temperate fruit crop that favours temperatures in the range of 21–24°C. Grows best in well-drained loamy soil with a pH around 6.0 to 7.0 and with annual rainfall of 800–1100mm. Intercropped in cocoa plantations.

Agronomic and edaphic requirements

Propagated by seeds or grafting. A spacing of 2–3m between plants and 3–4m from row to row is ideal. The tree can be pruned to the desired shape. Fruit is hand-picked when it has reached optimum colour and size. Major pests and diseases include aphids, thrips, spider mites, fruit flies, apple scab, powdery mildew and Armillaria root rot. Trees produce flowers four years after planting and continue to produce good yields after 25 years.

Environmental and economic benefits

Source of income for farmers. Exported for foreign exchange. Ornamental.

Traditional culinary art

Eaten fresh or dried. Fruit used as flavouring for soups, sauces and stews. Unripe fruit eaten with salt and sugar or added to a salad.

Value-added processing technologies and products

Fruit can be made into preserves and juice.

Potential for use as livestock feed

Fruit waste and byproducts are used as livestock feed.

Potential for use as an industrial raw material

Fruit juice.


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©FAO/Pius Utomi Ekpei

COMMON NAME

Groundnut (peanut)

SCIENTIFIC NAME

Arachis hypogaea

Agroecological diversity

A legume grown mainly for its edible seeds, commonly known as peanuts. Groundnut requires a warm climate with loose, well drained, fertile soils. It can be intercropped with other commodities as cereals and other legumes.

Agronomic and edaphic requirements

Propagated by seeds. Requires organic manure or fertilizer for high yield.

Environmental and economic benefits

Source of income for farmers. Seeds have been used as beads in necklaces and rosaries. Seeds used as weights for balances and children's toys. Crop residue used as fuel. Used as green manure for nitrogen fixation.

Nutritional composition

NUTS

Energy (kcal)	593
Calcium (mg)	117
Water (g)	5.9
Iron (mg)	5.5
Protein (g)	20.1
Zinc (mg)	2.24
Fat (g)	48.4
Vitamin A (RE) (µg)	1
Carbohydrates avail. (g)	15.0
Folate (µg)	110
Dietary fibre (g)	8.3

Source: Kenya food composition tables, 2018 (food code: 10009)

Traditional culinary art

Peanut butter, beverages, spices.

Value added processing technologies and products

Peanut butter.

Potential for use as livestock feed

Byproducts are used as animal feed.

Potential for use as an industrial raw material

Making peanut butter and cooking oil.


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COMMON NAME

Guava

SCIENTIFIC NAME

Psidium guajava

Agroecological diversity

Guava is grown in the tropics and subtropics. Diverse climate and soil conditions. Altitude 0–2100m. Mean temperature 20–30°C. Annual rainfall 1000–2000mm.

Agronomic and edaphic requirements

It is vegetatively propagated by cuttings planted in sand beds. Bears fruits after 2–3 years, attaining full capacity at 8–10 years. Self-pollinated or cross-pollinated. Seeds remain viable for one year at 8°C and low humidity. Planted at a distance of 5–8m. Standard spacing is 6 × 6m, accommodating 112 plants per acre. Fertilizer doses vary depending on region and cultivar. Irrigation is provided at an interval of 20–25 days during the rainy season and 10–15 days during the dry season. Fruiting trees are pruned to prevent overcrowding. Pest include fruit flies, stem borers, bark eating caterpillars, thrips, nematodes, mealybugs and scale insects. Main diseases are wilt, fruit canker, fruit rot, anthracnose and grey leaf spot.

Environmental and economic benefits

Source of income for farmers. Used for wood, fuel and as shelter.

Nutritional composition

FRUITS

Energy (kcal)	49
Calcium (mg)	20
Water (g)	80.7
Iron (mg)	0.4
Protein (g)	1.1
Zinc (mg)	0.26
Fat (g)	1.1
Vitamin A (RE) (µg)	45
Carbohydrates avail. (g)	0.8
Folate (µg)	16
Dietary fibre (g)	15.5

Source: Kenya food composition tables, 2018 (food code: 05011)

Traditional culinary art

Used in chutney. Eaten fresh or in juices and smoothies.

Value added processing technologies and products

Jam, jellies, marmalade, fruit juice, marmalade.

Potential for use as livestock feed

Leaves used for forage.

Potential for use as an industrial raw material

Fruits used in processing jam and jellies.


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COMMON NAME

Horned melon

SCIENTIFIC NAME

Cucumis metuliferus

Agroecological diversity

Horned melon grows in cold and mist conditions at altitudes of 210–1800m. Optimum temperature is 20–30°C and rainfall is 350–550mm. It grows well in shallow or deep, well-drained soils, alluvial sandy soils, clay or loam.

Agronomic and edaphic requirements

It is propagated using seeds and requires manure and fertilizers for quality fruits. Pests and diseases include thrips, fruit flies and downy mildew.

Environmental and economic benefits

Source of income for farmers. Fruit for decoration.

Nutritional composition

FRUITS

Energy (kcal)	41
Calcium (mg)	10
Water (g)	89.2
Iron (mg)	0.4
Protein (g)	1.5
Zinc (mg)	0.40
Fat (g)	0.9
Vitamin A (RE) (µg)	6
Carbohydrates avail. (g)	5.4
Folate (µg)	2
Dietary fibre (g)	2.6

Source: The standard tables of food composition in Japan, 2015 (food code: 07055)

Traditional culinary art

The fruit is used in salads and the leaves are eaten as vegetables.

Value added processing technologies and products

Fruit juices, flavour in yoghurt and ice cream.

Potential for use as livestock feed

Used as fodder for animals.

Potential for use as an industrial raw material

Fruit juice.


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COMMON NAME

Jackbean

SCIENTIFIC NAME

Canavalia ensiformis

Agroecological diversity

Jackbean grows well in temperate to tropical areas at elevations up to 1500m. Ideal daytime temperatures are within the range of 20–28°C and annual rainfall is 800–2000mm. The soil needs to be rich in organic matter, with a pH in the range of 5–6. The plant is shade-tolerant, drought-resistant and immune to pests.

Agronomic and edaphic requirements

Propagated as seeds. Planted in full sun to light shade in seed beds roughly 45–90cm apart. Can be used as cover crop or green manure. Green pods are produced in 80–120 days and mature seeds produced after 180–300 days.

Environmental and economic benefits

Source of income for farmers. Used as green manure for nitrogen fixation.

Nutritional composition

DRY SEEDS

Energy (kcal)	335
Calcium (mg)	119
Water (g)	11.1
Iron (mg)	4.4
Protein (g)	24.1
Zinc (mg)	2.42
Fat (g)	4.2
Vitamin A (RE) (µg)	3
Carbohydrates avail. (g)	42.4
Folate (µg)	480
Dietary fibre (g)	15.6

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 03_052)

Traditional culinary art

Seedpod is eaten raw or cooked as a vegetable. Seeds cooked and eaten like broad beans.

Value added processing technologies and products

Roasted and used as a coffee substitute.

Potential for use as livestock feed

Used in animal feed.

Potential for use as an industrial raw material

Roasted and used as a coffee substitute.


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COMMON NAME

Jackfruit

SCIENTIFIC NAME

Artocarpus heterophyllus

Agroecological diversity

A tropical fruit propagated by seeds or grafting. Intercropped with pulses or vegetables. Flourishes in rich, deep soil of medium or open texture; laterite soil. Drought intolerant. Altitude of 1 200–1 500m. Used by animals for shelter.

Agronomic and edaphic requirements

Grows in dry and humid plains with fertile and well-drained sandy loam. Land must be weed-free and prepared with fine tilth. Pit size 1m^3 and distance of 6m. Grafts staked then mulched. Can be rain-fed or planted under irrigation. Needs weeding and mulching. Supplement with manure or fertilizer during the rainy season. Trained to single stem. Common pests and diseases include brown weevils and fruit rot. Ready for harvesting seven years after planting. Yields 25 to 100 fruits.

Environmental and economic benefits

Source of income for farmers. Ornamental.

Nutritional composition

FRUITS

Energy (kcal)	95
Calcium (mg)	35
Water (g)	73.2
Iron (mg)	0
Protein (g)	1.4
Zinc (mg)	0.76
Fat (g)	0.2
Vitamin A (RE) (µg)	15
Carbohydrates avail. (g)	20.5
Folate (µg)	19
Dietary fibre (g)	2.8

Source: Kenya food composition tables, 2018 (food code: 05012)

Traditional culinary art

Used in baking and to make smoothies, desserts and salads. Fruit is cooked green. Seeds cooked or eaten raw.

Value added processing technologies and products

Candy, fruit leather, ice cream, juice, wine, jam, pickles.

Potential for use as livestock feed

Its leaves are commonly used for feeding goats as these are well-liked and are a good source of protein and energy.


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COMMON NAME

Jambolan (Java plum)

SCIENTIFIC NAME

Syzygium cumini

Agroecological diversity

Humid moist and dry climate with sufficient rain (900–1200mm annually). Altitude 0–1800m. Annual temperature −2°C to 48°C. Shallow and rocky soils.

Agronomic and edaphic requirements

Can reach full height in 40 years. Fruit, in clusters of just a few or 10 to 40, is round or oblong. Fruit matures in 90 days. The plant propagates easily from fresh seed, bearing fruit when 8–10 years old. Young plants need training. Susceptible to scale insects, fruit flies and birds. Diseases include algal leaf spot, mushroom root rot and anthracnose.

Environmental and economic benefits

Source of income for farmers, apiculture, fuel and timber.

Nutritional composition

FRUITS

Energy (kcal)	42
Calcium (mg)	3
Water (g)	87.7
Iron (mg)	0
Protein (g)	0.5
Zinc (mg)	0.05
Fat (g)	0.1
Vitamin A (RE) (µg)	-
Carbohydrates avail. (g)	8.9
Folate (µg)	-
Dietary fibre (g)	1.8

Source: Brazilian food composition table (TACO), 2011 (food code: 206)

Traditional culinary art

Eaten fresh, dessert.

Value added processing technologies and products

Red wine, jam, juice.

Potential for use as livestock feed

Yields brown dye.


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COMMON NAME

Jute mallow

SCIENTIFIC NAME

Corchorus olitorius

Agroecological diversity

Jute mallow is cultivated in south Asia, east Asia, tropical Africa, the Near East, Brazil and the Caribbean. Grows well in the lowland tropics and warm temperate zones. Annual rainfall 400–4290mm. Optimal temperatures are in the range of 16.8–27.5°C. Soil pH of 4.5–8.2.

Agronomic and edaphic requirements

Propagated using seeds. Grown in rows with a spacing of 20–50cm. The fruits can be harvested six weeks after flowering. Dried capsules are threshed and can be stored for 8–12 twelve months in well-sealed jars. Manure made from cow dung, wood ash or rotted water hyacinth or its ashes is used. Harvest can begin after about six weeks. The whole plant can be directly harvested or leaves can be harvested by pruning several times during the vegetation period. Diseases (bacterial and viruses infections) are not as serious as pests (insect and nematode attacks).

Environmental and economic benefits

Wood used in making sulphur matches. Jute fibres are cured and dried for use in textiles such as yarn, twine and sacking.

Nutritional composition

LEAVES

Energy (kcal)	45
Calcium (mg)	207
Water (g)	82.3
Iron (mg)	6.3
Protein (g)	4.6
Zinc (mg)	0.58
Fat (g)	0.2
Vitamin A (RE) (µg)	434
Carbohydrates avail. (g)	2.1
Folate (µg)	117
Dietary fibre (g)	8.3

Source: Kenya food composition tables, 2018 (food code: 04018)

Traditional culinary art

Leaves and tender stems are boiled and eaten. Added to stews, stir-fries and soups. Sticky leaf mass is used as a vegetable spread.

Value-added processing technologies and products

Dried and used in baked products.

Potential for use as livestock feed

Livestock fodder.

Potential for use as an industrial raw material

Dry powder used as composite flour in baked products.


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COMMON NAME

Kidney bean

SCIENTIFIC NAME

Phaseolus vulgaris

Agroecological diversity

Kidney beans grow well in temperate areas with 60–150cm rainfall annually and a temperature range of 15–250°C. Plants prefer well-drained, rich, loamy soils and heavy soils. Soil pH 5.5–6.0. Prefer full sun but can tolerate light shade.

Agronomic and edaphic requirements

Propagated using seeds. Requires farmyard manure or any organic compost to make the soil rich in fertility. It also requires fertilizers with a good amount of nitrogen. A seed rate of 50kg/ha, row spacing of 30cm, and plant-to-plant spacing of 10–15cm. Harvested after 120–130 days of maturity. Pests include anthracnose and pod borers.

Environmental and economic benefits

Source of income for farmers.

Nutritional composition

DRY SEEDS

Energy (kcal)	305
Calcium (mg)	106
Water (g)	12.1
Iron (mg)	6.4
Protein (g)	20.5
Zinc (mg)	2.78
Fat (g)	2.0
Vitamin A (RE) (µg)	1
Carbohydrates avail. (g)	40.6
Folate (µg)	272
Dietary fibre (g)	21.2

Source: Kenya food composition tables, 2018 (food code: 03004)

Traditional culinary art

Used in the cuisine of India, where the beans are known as rajma. Red kidney beans are used in southern Louisiana for the classic Monday Creole dish of red beans and rice.

Value added processing technologies and products

Dried and ground into flour.

Potential for use as livestock fodder

Leaves used as livestock fodder.

Potential for use as an industrial raw material

Dried to make bean paste.


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COMMON NAME

Lima bean

SCIENTIFIC NAME

Phaseolus lunatus

Agroecological diversity

Lima beans are grown in a wide range of environment in Africa. They tolerate acidic and poor soils. Optimal annual rainfall is 750–1400mm and temperature range is 19–30°C. Well-drained sandy to sandy loam soils with pH 5.0–6.0.

Agronomic and edaphic requirements

Propagated using seeds, roots or stem cuttings.

Environmental and economic benefits

Fixes nitrogen to the soil. Source of income for farmers.

Nutritional composition

DRY SEEDS

Energy (kcal)	315
Calcium (mg)	56
Water (g)	10
Iron (mg)	4.6
Protein (g)	21.6
Zinc (mg)	1.97
Fat (g)	1.5
Vitamin A (RE) (µg)	tr
Carbohydrates avail. (g)	44.8
Folate (µg)	180
Dietary fibre (g)	17.9

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 03_058)

Traditional culinary art

Seeds cooked as a meal. Dry mature seeds, young leaves, young pods and sprouts are consumed as vegetables. Shoots and young plants are cooked. Flour of dried seed is used as a thickener in soups.

Value-added processing technologies and products

Flour from seeds is used in baked products like bread.

Potential for use as livestock feed

Livestock fodder.

Potential for use as an industrial raw material

Seeds are dried and ground into flour for use in baked products.


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COMMON NAME

Little millet

SCIENTIFIC NAME

Panicum sumatrense

Agroecological diversity

A drought-resistant cereal crop grown in semi-arid tropical regions in Africa and Asia.

Agronomic and edaphic requirements

A traditional crop planted by broadcasting. Tiny seeds. Matures in only three months. Harvested by cutting the heads, then they are sun dried, threshed and winnowed. Can be stored for over ten years. Susceptible to birds, chafer grubs, stem borers, shoot flies, midges, aphids and army worms. Diseases include grain smut and head blast.

Environmental and economic benefits

Source of income The deep roots help stabilize the soil. Dense cover helps protect the ground and preserve moisture. Fixes atmospheric nitrogen.

Nutritional composition

DRY SEEDS

Energy (kcal)	353
Calcium (mg)	16
Water (g)	11.4
Iron (mg)	1.3
Protein (g)	10.1
Zinc (mg)	1.82
Fat (g)	3.9
Vitamin A (RE) (µg)	0
Carbohydrates avail. (g)	65.6
Folate (µg)	-
Dietary fibre (g)	7.7

Source: Indian food composition tables, 2017 (food code: A016)

Traditional culinary art

Grains ground into flour to make foods like porridge and ugali (stiff porridge).

Value-added processing technologies and products

Flour and grains used in local beer brewing in western Kenya.

Potential for use as livestock feed

Seeds used in poultry feed. Stem and leaves fed to livestock.

Potential for use as an industrial raw material

Seeds can be processed into flour used in various products.


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COMMON NAME

Mango

SCIENTIFIC NAME

Mangifera indica

Agronomic and edaphic requirements

Mango trees are propagated by seeds. They require soil with rich organic matter and regular application of fertilizer or manure. Can be intercropped with short-lived trees such as papaya and other annual crops. Avoid crops which share common diseases. Mango crops are attacked by mango seed weevils, fruit flies, mango scales and mealybugs. Diseases include powdery mildew, anthracnose and jelly seed. Maturity Period: 12–16 weeks after fruit set.

Environmental and economic benefits

Source of income for farmers and food for wild animals. Mango flowers are a rich source of nectar collected by honey bees. Mango timber can be used for carving, building furniture, making utensils and for wall and floor panelling.

Nutritional composition

FRUITS

Energy (kcal)	52
Calcium (mg)	8
Water (g)	85.8
Iron (mg)	0.1
Protein (g)	0.9
Zinc (mg)	0.08
Fat (g)	0.2
Vitamin A (RE) (µg)	87
Carbohydrates avail. (g)	10.7
Folate (µg)	40
Dietary fibre (g)	2.1

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 05_037)

Traditional culinary art

Eaten raw, added to salads or made into juices and smoothies.

Value added processing technologies and products

Juice, wine and mango leather.

Potential for use as livestock feed

Livestock graze on mango leaves and eat fallen fruits. Seed byproducts are fed to cattle, poultry and pigs.

Potential for use as an industrial raw material

Production of juice, jam, concentrate and puree.


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COMMON NAME

Marula

SCIENTIFIC NAME

Sclerocarya birrea

Agroecological diversity

A woody plant that grows in the Limpopo and Mpumalanga provinces of South Africa and a few other drier locations in Africa. Wildlife such as baboons, rhinos, giraffes and elephants consume marula fruit.

Agronomic and edaphic requirements

Grows in woodland sandy loam soil. It is propagated by seeds and grows 9–18m tall.

Environmental and economic benefits

Source of income for farmers. Wood for carvings to make stools, beehives, bowls and drums. Inner bark is used to make ropes.

Nutritional composition

FRUITS

Energy (kcal)	51
Calcium (mg)	35
Water (g)	86.3
Iron (mg)	3.4
Protein (g)	0.7
Zinc (mg)	0.31
Fat (g)	0.5
Vitamin A (RE) (µg)	-
Carbohydrates avail. (g)	10.4
Folate (µg)	-
Dietary fibre (g)	1.2

Source: Priority food tree and crop food composition database, 2019 (food code: F0041)

Traditional culinary art

Fruit is eaten fresh and can be added to salads. Seeds are roasted and eaten as a snack. Seeds add flavour to food, smoothies and cheesecake.

Value added processing technologies and products

Marula juice, cream, oil and jellies.

Potential for use as livestock fodder

Leaves are harvested as fodder for livestock. Fruits and leaves are eaten by wild animals.

Potential for use as an industrial raw material

Oil is used in many cosmetics products and as a pesticide. Fruits are used to make juice and liquor.

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COMMON NAME

Melon

SCIENTIFIC NAME

Cucumis melo

Agroecological diversity

Melon is cultivated in Africa, Asia, Europe and central America. It is a tropical, annual, trailing herb that grows well in subtropical or warm climates. It prefers dappled shade and does not do well in the open or on flat land. Grows best in a soil rich in manure or partially decomposed organic matter.

Agronomic and edaphic requirements

Propagated by seeds. Cross-pollination. Vulnerable to downy mildew, anthracnose, cucumber beetle, melon aphid, melon worm moth.

Environmental and economic benefits

Source of income. Foliage improves soil fertility.

Nutritional composition

FRUITS

Energy (kcal)	38
Calcium (mg)	11
Water (g)	89.3
Iron (mg)	0.4
Protein (g)	0.8
Zinc (mg)	0.1
Fat (g)	0.1
Vitamin A (RE) (µg)	129
Carbohydrates avail. (g)	8
Folate (µg)	22
Dietary fibre, total (g)	1

Source: FAO/INFOODS Food Composition Table for Western Africa, 2019 (food code: 05_039)

Traditional culinary art

Eaten as a fruit or added to desserts and meals.

Value-added processing technologies and products

Extraction of oil from seeds. Used to make wine.

Potential for use as livestock feed

Leaves used as livestock feed.

Potential for use as an industrial raw material

Seed oil used for soap-manufacture and for illumination. Wine production.

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COMMON NAME

Milk thistle

SCIENTIFIC NAME

Sonchus oleraceus

Agroecological diversity

An annual plant that grows at elevations up to 2500m.

Agronomic and edaphic requirements

Propagated by seeds. Requires moist soils, rich in sodium, phosphorus, potassium and calcium.

Environmental and economic benefits

Grazed by both wild and farmed livestock.

Nutritional composition

LEAVES

Energy (kcal)	30
Calcium (mg)	126
Water (g)	90.2
Iron (mg)	1.3
Protein (g)	2.7
Zinc (mg)	1.33
Fat (g)	0.70
Vitamin A (RE) (µg)	-
Carbohydrates avail. (g)	1.4
Folate (µg)	-
Dietary fibre (g)	3.5

Source: Brazilian food composition table (TACO), 2011 (food code: 155)

Traditional culinary art

Leaves eaten as salads or cooked like spinach. Roots used as a coffee substitute.

Value-added processing technologies and products

Dried and ground into powder.

Potential for use as livestock feed

Beneficial to pigs, hare and rabbit.

Potential for use as an industrial raw material

Leaves dried and sold as a powder.


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COMMON NAME

Monkey orange

SCIENTIFIC NAME

Strychnos cocculoides

Agroecological diversity

A tropical and subtropical deciduous tree growing up to 5m tall. Rainfall 250–500mm, temperature range 16–26°C, elevation 400–2000m. Deep, sandy, well-drained soil, dark grey clays, red loamy sands, soils on slopes. Soil pH 4–7.5.

Agronomic and edaphic requirements

Fruit production after 4–6 years. Has 10–100 light green or yellow seeds. Vegetatively propagated or grafted. Responds well to inorganic fertilizers. No major pests or diseases.

Environmental and economic benefits

Dye obtained from the fruit is used to colour trays and containers. Provides protection from insect attack. Wood used as fuel and building materials. Fruit used as soap for washing clothes. Leaves are crushed, soaked in water, and used as spray for vegetables to repel insects such as aphids and scale.

Nutritional composition

FRUITS

Energy (kcal)	62
Calcium (mg)	39
Water (g)	81.6
Iron (mg)	1.1
Protein (g)	2.1
Zinc (mg)	0.15
Fat (g)	0.2
Vitamin A (RE) (µg)	-
Carbohydrates avail. (g)	11.7
Folate (µg)	-
Dietary fibre (g)	2.6

Source: Priority food tree and crop food composition database, 2019 (food code: F0044)

Traditional culinary art

Made into fruit rolls, porridge, sauce and flour. Fruit eaten raw or cooked.

Value added processing technologies and products

Fruit leather, preserves, marmalade, juice, jam. Seeds can be dried for future use.

Potential for use as an industrial raw material

Juice, jam.


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COMMON NAME

Moringa

SCIENTIFIC NAME

Moringa oleifera

Agroecological diversity

Moringa is a drought-resistant tree cultivated in India and sub-Saharan Africa. Mean annual rainfall of 300–1000mm. It prefers sandy soils and altitudes up to 1450m.

Agronomic and edaphic requirements

Propagated using seeds, roots or stem cuttings.

Environmental and economic benefits

Wood, paper, liquid fuel, gum, shelter. Seeds used to purify water.

Nutritional composition

LEAVES

Energy (kcal)	79
Calcium (mg)	314
Water (g)	75.7
Iron (mg)	4.6
Protein (g)	6.4
Zinc (mg)	0.72
Fat (g)	1.6
Vitamin A (RE) (µg)	2924
Carbohydrates avail. (g)	5.6
Folate (µg)	-
Dietary fibre (g)	8.2

Source: Indian food composition tables, 2017 (food code: C019)

PODS

Energy (kcal)	40
Calcium (mg)	33
Water (g)	85.4
Iron (mg)	0.7
Protein (g)	2.6
Zinc (mg)	0.31
Fat (g)	0.1
Vitamin A (RE) (µg)	3
Carbohydrates avail. (g)	3.8
Folate (µg)	-
Dietary fibre (g)	6.8

Source: World Vegetable Center phytonutrient data, 2023 (food codes: TWN0255, TWN0120, TWN0121)

Traditional culinary art

Leaves are boiled and fed to babies. Leaves and pods are sliced and cooked as vegetables or fried.

Value-added processing technologies and products

Seeds used for extraction of fuel oil.

Potential for use as livestock feed

Livestock fodder.

Potential for use as an industrial raw material

Seeds crushed and used in ointments.


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COMMON NAME

Mung bean

SCIENTIFIC NAME

Vigna radiata

Agroecological diversity

A deep-rooted, drought-tolerant shrub cultivated in east and west Africa and other parts of the world. Adapted to dry conditions with annual rainfall of 750–900mm.

Agronomic and edaphic requirements

Propagated by seeds. Attacked by bacterial leaf spot.

Environmental and economic benefits

Used as forage. Nitrogen-fixing crop.

Nutritional composition

DRY SEEDS

Energy (kcal)	311
Calcium (mg)	151
Water (g)	11.6
Iron (mg)	7.6
Protein (g)	27.2
Zinc (mg)	2.62
Fat (g)	1.7
Vitamin A (RE) (µg)	19
Carbohydrates avail. (g)	38.4
Folate (µg)	607
Dietary fibre (g)	16.7

Source: Kenya food composition tables, 2018 (food code: 03019)

Traditional culinary art

Boiled and then fried to make stew.

Value-added processing technologies and products

Ground into flour to make baked products.

Potential for use as livestock feed

Livestock fodder.

Potential for use as an industrial raw material

Dried for future use. Substrate for starch noodles.


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COMMON NAME

Mushroom

SCIENTIFIC NAME

Pleurotus ostreatus

Agroecological diversity

Mushrooms are the fruiting body of a fungus. They grow above ground, preferably under shade with indirect sunlight. Mushrooms grow on base materials unusual to their natural environment. Fast-rotting materials from deciduous trees are favoured for their growth.

Agronomic and edaphic requirements

Propagated from spores by several methods such as tray culture, vertical wall culture, and bag and column culture. The substrate is usually enriched with protein- and carbohydrate-rich supplements such as rice, ground corn, wheat bran or oat bran to increase yields.

Environmental and economic benefits

Source of income for farmers. Dyeing wool. Lowers bacterial levels in contaminated water.

Nutritional composition

OYSTER MUSHROOMS, FRESH

Energy (kcal)	36
Calcium (mg)	1
Water (g)	89.4
Iron (mg)	0.7
Protein (g)	3.3
Zinc (mg)	1.0
Fat (g)	0.3
Vitamin A (RE) (µg)	0
Carbohydrates avail. (g)	3.6
Folate (µg)	92
Dietary fibre (g)	2.6

Source: The standard tables of food composition in Japan, 2015 (food code: 08026)

Traditional culinary art

Cooked as a vegetable.

Value added processing technologies and products

Dried and ground for use in baked products.

Potential for use as an industrial raw material

Produces wool dye.

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COMMON NAME

Noni

SCIENTIFIC NAME

Morinda citrifolia

Agroecological diversity

A fruit-bearing tree that grows in tropical and subtropical areas of the world. Both dry and humid climates, altitude up to 1500m, temperature 20–35°C, and soil pH of 4.4–9.

Agronomic and edaphic requirements

Matures within 18 months. Flowers and fruits year-round. The oval yellow fruit is attractive to weaver ants, fruit bats and fruit flies. The tree is propagated using seeds, stem or root cuttings and air layering.

Traditional culinary art

Eaten raw.

Value-added processing technologies and products

Juice, powders, cosmetics, oil.

Potential for use as livestock feed

Dried fruit powder used to supplement poultry feed due to its nutritional and antibacterial properties.

Potential for use as an industrial raw material

Used for making dye and as a cosmetics ingredient.

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COMMON NAME

Passion fruit

SCIENTIFIC NAME

Passiflora edulis

Agroecological diversity

A tropical and subtropical fruit vine that grows well at altitudes of 0–800m, soil pH of 6–8, annual rainfall of 1000–1200mm and temperatures of 18–23°C.

Agronomic and edaphic requirements

It requires well-drained clay and sandy soils that are heavily manured. Propagated through seeds, stem cutting and grafting. Pests and diseases include thrips, fruit flies, white scale, downy mildew and anthracnose.

Environmental and economic benefits

Source of income for farmers.

Nutritional composition

FRUITS

Energy (kcal)	74
Calcium (mg)	5
Water (g)	82.9
Iron (mg)	0.6
Protein (g)	2.0
Zinc (mg)	0.39
Fat (g)	21.0
Vitamin A (RE) (µg)	-
Carbohydrates avail. (g)	11.1
Folate (µg)	-
Dietary fibre (g)	1.1

Source: Brazilian food composition table (TACO), 2011 (food code: 232)

Traditional culinary art

Eaten fresh or squeezed into juice.

Value added processing technologies and products

Concentrate, juice, jam, wine.

Potential for use as an industrial raw material

Fruit juice and concentrate.


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COMMON NAME

Pawpaw (papaya)

SCIENTIFIC NAME

Carica papaya

Agroecological diversity

A well-adapted African fruit tree that grows well in wetter areas.

Agronomic and edaphic requirements

Requires nematode free, fertile, loamy soil that is well drained, permeable and well aerated. Grown from seed. Develops rapidly, with fruit being produced before the end of the first year. Plant may live five years or more. Use of fertilizer can significantly improve the yield. Can produce 30–150 fruits per year. Pests include white scale, xyleborus beetle, fruit flies, mites, root-knot nematodes, polyphagous grasshoppers, moles and crickets. Diseases are ring spot virus, anthracnose, cercospora leaf spot and powdery mildew.

Environmental and economic benefits

Source of income for farmers.

Nutritional composition

FRUITS

Energy (kcal)	59
Calcium (mg)	21
Water (g)	84.0
Iron (mg)	0.8
Protein (g)	0.4
Zinc (mg)	0.15
Fat (g)	0.1
Vitamin A (RE) (µg)	126
Carbohydrates avail. (g)	13.0
Folate (µg)	37
Dietary fibre (g)	2.1

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 05_017)

Traditional culinary art

Breakfast, dessert, fruit salad. Green fruit is pickled or cooked as a vegetable.

Value added processing technologies and products

Juice, jam, marmalade and candies.

Potential for use as livestock feed

Stem, fruit and leaves are fed to livestock.

Potential for use as an industrial raw material

Pharmaceutical uses including extraction of papain and proteolytic enzyme present in the latex. Collected mainly from green fruits. Also used industrially for chill-proofing beer, tenderizing meat, bathing hides, degumming silk and softening wool.


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COMMON NAME

Pearl millet

SCIENTIFIC NAME

Pennisetum glaucum

Agroecological diversity

Pearl millet is grown in west and east Africa. It requires a light, well-drained soil in a sunny location. The plant is drought resistant and tolerant of dry, infertile soils. Often intercropped with one to several crops, including cowpea, sorghum and groundnut.

Agronomic and edaphic requirements

Propagated by seed, usually sown directly in the field. Matures within 75–180 days after planting. Spacing of 45 × 45cm to 200 × 200cm.

Environmental and economic benefits

Staple food. Prevents soil erosion and conserves moisture. Source of income for farmers.

Nutritional composition

DRY GRAINS

Energy (kcal)	366
Calcium (mg)	23
Water (g)	9.4
Iron (mg)	15.2
Protein (g)	9.3
Zinc (mg)	2.58
Fat (g)	5.9
Vitamin A (RE) (µg)	1
Carbohydrates avail. (g)	64.3
Folate (µg)	160
Dietary fibre (g)	9.0

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 01_017)

Traditional culinary art

The seeds are eaten raw or cooked. Can be used like rice in sweet or savoury dishes, or can be ground or pounded into a flour and used for making bread or porridge.

Value-added processing technologies and products

Seeds ground into flour and grains used to make fermented beverages.

Potential for use as livestock feed

Seeds used in poultry feed. Stem and leaves fed to livestock.


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COMMON NAME

Pigeon pea

SCIENTIFIC NAME

Cajanus cajan

Agroecological diversity

Pigeon pea is cultivated in tropical Africa, America and India. Cultivated in many parts of Kenya. Temperature range of 18–38°C and annual rainfall of 600–1000 mm. Well-drained clayey, sandy soil with pH 5–7.

Agronomic and edaphic requirements

Propagated by seed. Seeds should be sown in rows with spacing of 30–50cm × 75–150cm and 10cm deep. Seeds are up to nine per pod. Green, turning cream or light brown on drying. Pests include aphids, leafhoppers, cowpea seed beetle, root nematodes, red spider mite, thrips, bugs and pod borer. Diseases include fusarium wilt, cercospora leaf spot, macrophomina stem, phytophthora blight, powdery mildew and rust.

Environmental and economic benefits

Biological nitrogen fixation. Stems are used for baskets and firewood.

Nutritional composition

DRY SEEDS

Energy (kcal)	311
Calcium (mg)	121
Water (g)	11.1
Iron (mg)	4.5
Protein (g)	20.8
Zinc (mg)	2.49
Fat (g)	2.1
Vitamin A (RE) (µg)	17
Carbohydrates avail. (g)	41.6
Folate (µg)	340
Dietary fibre (g)	21.0

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 03_032)

Traditional culinary art

Immature pods eaten as a vegetable, mashed with other foods like potatoes and maize, or made into a stew. Important to Kikuyu people during circumcision.

Value-added processing technologies and products

Ground to flour and used in baby foods.

Potential for use as livestock feed

Used as a fodder plant after harvesting during the dry season. Dry leaves and pod after harvesting used as food for donkeys, cattle and goats.

Potential for use as an industrial raw material

Flour used in complementary foods.


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COMMON NAME

Pineapple

SCIENTIFIC NAME

Ananas comosus

Agroecological diversity

A tropical herbaceous perennial plant. Optimal temperature around 25°C. Requires soils with good drainage and aeration, sandy loam with high organic matter. Soil pH 4.5 to 5.5. Annual rainfall 500–5550mm.

Agronomic and edaphic requirements

Land preparation by ploughing. Propagated by sucker, slip and crown. Fruit is ready after 15–18 months. Spacing of 25 × 60 × 90cm by furrow, contour or trench method. Cultivated under rain-fed conditions or under irrigation. Pests and diseases include mealybugs, scale insects, stem rot.

Environmental and economic benefits

Source of income for farmers. Leaves are a traditional source of fibre for weaving ropes and clothes. Ornamental.

Nutritional composition

FRUITS

Energy (kcal)	41
Calcium (mg)	16
Water (g)	88.6
Iron (mg)	0.4
Protein (g)	0.5
Zinc (mg)	0.37
Fat (g)	0.2
Vitamin A (RE) (µg)	5
Carbohydrates avail. (g)	8.1
Folate (µg)	32
Dietary fibre (g)	2.3

Source: Kenya food composition tables, 2018 (food code: 05030)

Traditional culinary art

Flesh eaten and juice extracted from the fruit. Eaten as a snack or dessert. Pizza toppings.

Value added processing technologies and products

Jam, sweets, yoghurt, ice cream. Canned fruit.

Potential for use as livestock feed

Pineapple waste is reported to be used as additional feed and can replace 50% of ruminant forage in the total mixed ration.

Potential for use as an industrial raw material

Canned fruit.


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COMMON NAME

Plantain banana

SCIENTIFIC NAME

Musa spp

Agroecological diversity

A tropical plant that grows best under warm conditions and with a mean rainfall of 75mm per month. Widely adapted, growing at elevations of 0–920m or more. Mean annual temperatures of 26–30°C. Annual rainfall of 2000mm or higher. Interplanting and cultivation in full sun. Requires daily water supply from rainfall or irrigation all year around.

Agronomic and edaphic requirements

Well-drained, sandy loams and sandy clay loams are ideal soils. Propagation is by vegetative division through sucker or rhizome and rarely by seeds. Spacing varies according to the cultivar, soil fertility and season of planting. Apply a balanced fertilizer once a month (an 8:10:8 NPK fertilizer appears to be adequate). Major pests are burrowing nematodes, banana thrips, banana weevil borers and moles. Diseases include Panama disease, black leaf streak and bacterial wilt. Harvesting starts 8–9 months after planting.

Environmental and economic benefits

Source of income for farmers. Ornamental. Shelter and clothing. Agroforestry.

Nutritional composition

FRUITS

Energy (kcal)	144
Calcium (mg)	6
Water (g)	62.4
Iron (mg)	1.1
Protein (g)	1.4
Zinc (mg)	0.14
Fat (g)	0.2
Vitamin A (RE) (µg)	127
Carbohydrates avail. (g)	32.9
Folate (µg)	22
Dietary fibre (g)	2.3

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 02_042)

Traditional culinary art

Often cooked, boiled, sautéed, fried or baked before consumption.

Value added processing technologies and products

Dried and ground into flour for baking; used for making chips and banana crisps.

Potential for use as livestock feed

Stem and leaves used as fodder.

Potential for use as an industrial raw material

Starch.


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COMMON NAME

Prickly pear (cactus)

SCIENTIFIC NAME

Opuntia ficus-indica

Agroecological diversity

Grows in arid zones with poor soils; drought-resistant with succulent stem.

Agronomic and edaphic requirements

It grows well in coarse, sandy soil with low organic matter content. The semi-desert cactus may be exposed to high light levels in the wild, but in a greenhouse with high light levels and temperatures they often require shade. They are propagated by seed, cuttings or grafting. The seed is sown in a moist growing medium and then kept in a covered environment for 7–10 days after germination. A temperature of 22°C is suitable. Major pests include mealybugs, scale insects, thrips, red spider mites and snails. It is also attacked by bacteria, viruses and fungi.

Environmental and economic benefits

Source of income for farmers.

Nutritional composition

FRUITS

Energy (kcal)	54
Calcium (mg)	48
Water (g)	83.9
Iron (mg)	0.4
Protein (g)	0.4
Zinc (mg)	0.6
Fat (g)	0.3
Vitamin A (RE) (µg)	8
Carbohydrates avail. (g)	10.1
Folate (µg)	6
Dietary fibre (g)	4.6

Source: The Australian food composition database, Release 1, 2019 (food code: F007457)

Traditional culinary art

Refreshment, syrup and dessert.

Value added processing technologies and products

Wine and jam.

Potential for use as livestock feed

Fodder for animals after burning the spine.

Potential for use as an industrial raw material

Juice processing. Used for processing dye.


©FARA

COMMON NAME

Pumpkin

SCIENTIFIC NAME

Cucurbita moschata

Agroecological diversity

Pumpkin grows best in warm and moist conditions in semi-tropical to tropical climates. It grows in sandy soils with the help of irrigation. Soil pH of 5.8–6.6. Altitude up to 2400 m, annual daytime temperatures of 20–30°C and mean annual rainfall of 600–1600 mm. Can be intercropped with maize or sorghum.

Agronomic and edaphic requirements

Propagated by seeds. Growing season of at least 150 days. Pests include aphids and spider mites. Diseases include bacteria wilt and viruses.

Environmental and economic benefits

Pumpkins reduce weeds, improve soil tilth, reduce fertilizer and pesticide leaching, and maintain soil water availability. They are also used decoratively.

Nutritional composition

FRUITS

Energy (kcal)	43
Calcium (mg)	18
Water (g)	87.3
Iron (mg)	1
Protein (g)	1.5
Zinc (mg)	0.2
Fat (g)	0.1
Vitamin A (RE) (µg)	320
Carbohydrates avail. (g)	7.8
Folate (µg)	31
Dietary fibre, total (g)	2.5

Source: Kenya Food Composition Tables, 2018 (food code: 04032)

Traditional culinary art

The fruits (pumpkins) are boiled, steamed or roasted and eaten as a vegetable either whole or mashed. Can be made into soups and puree or dessert. Leaves are used as a vegetable. Seeds are roasted and eaten.

Value-added processing technologies and products

Fruit mash used to make baked products.

Potential for use as livestock feed

Leaves are used as feed. Fruits liked by donkeys.

Potential for use as an industrial raw material

Baked products. Oil is extracted from seeds. Leaves dried for future use.


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COMMON NAME

Pumpkin

SCIENTIFIC NAME

Cucurbita pepo

Agroecological diversity

Pumpkin is native to north America, but is now grown in the wetter parts of Africa. It prefers moderately moist soil with full sunlight. To maximize growth, add compost to the surrounding soil in late autumn. Mulching around the squash aids with retaining moisture and reducing competition.

Agronomic and edaphic requirements

Performs well in vegetable gardens and on trellises. Acts as a cover for exposed soil. It is easily sown from seed, especially when the soil is warm. Host species for the melonworm moth, the squash vine borer and the pickleworm.

Nutritional composition

FRUITS

Energy (kcal)	34
Calcium (mg)	19
Water (g)	89.7
Iron (mg)	1
Protein (g)	1
Zinc (mg)	0.29
Fat (g)	0.1
Vitamin A (RE) (µg)	141
Carbohydrates avail. (g)	6
Folate (µg)	8
Dietary fibre, total (g)	2.4

Source: FAO/INFOODS Food Composition Table for Western Africa, 2019 (food code: 04_051)

Traditional culinary art

Fruits have a mild flavour and can be fried, baked, added to pasta or used in soups.

Value-added processing technologies and products

Fruits makes liquor after fermentation. Jam, juice.

Potential for use as livestock feed

Used as fodder.

Potential for use as an industrial raw material

Wood yields white writing and printing papers. Bark used in textile industries (tannin and dye).


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COMMON NAME

Purslane

SCIENTIFIC NAME

Portulaca oleracea

Agroecological diversity

An edible succulent found around the world in temperate and subtropical regions. Grows best in well-drained sandy soils from sea level to 2600m.

Agronomic and edaphic requirements

Reproduces primarily from seed or from vegetative cuttings. Pests include purslane sawfly, seed weevil (*Hypurus bertrandi*), seed bug (*Nysius vinitor*) and *Baris arctithorax*. Fungal infections include *Dichotomophthora portulacae*, *Drechslera indica* and *Helminthosporium portulacae*.

Environmental and economic benefits

Used as forage. Ground cover that keeps moisture in the soil.

Nutritional composition

Energy (kcal)	-
Calcium (mg)	65
Water (g)	92.9
Iron (mg)	2.0
Protein (g)	2.0
Zinc (mg)	0.17
Fat (g)	0.4
Vitamin A (RE) (µg)	-
Carbohydrates avail. (g)	-
Folate (µg)	12
Dietary fibre (g)	-

Source: USDA national nutrient database for standard reference, Legacy database, 2019 (food code: 169274)

Traditional culinary art

Cooked as a vegetable. Chopped raw into salad, stew or soup.

Potential for use as livestock feed

Livestock forage/fodder.

Potential for use as an industrial raw material

Dried and ground into flour.


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COMMON NAME

Redflower ragleaf

SCIENTIFIC NAME

Crassocephalum crepidioides

Agroecological diversity

Redflower ragleaf is used as a leafy vegetable and medicinal plant. It grows in the tropics and requires an annual rainfall of 600–1500mm and temperatures in the range of 23–30°C. Ragleaf grows well under shade and prefers well-drained light (sandy) and medium (loamy) soils.

Agronomic and edaphic requirements

Propagated using seeds or cuttings. Prefers moist soil that is rich in organic matter.

Environmental and economic benefits

Source of income for farmers. Ornamental. Used as a trap plant to collect adult corm weevils in banana plantations. Insect repellent.

Traditional culinary art

The leaves are lightly blanched and then cooked with peppers, onions, tomatoes, melon and sometimes fish or meat to make soups and stews. In Sierra Leone, the leaves are made into a sauce with groundnut paste.

Value-added processing technologies and products

Leaves dried for future use.

Potential for use as livestock feed

Used as fodder.

Potential for use as an industrial raw material

Dried for use as a vegetable.


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COMMON NAME

Roselle

SCIENTIFIC NAME

Hibiscus sabdariffa

Agroecological diversity

Roselle is cultivated in west, central and east Africa, as well as in central America. It is hardy and grows well in most well-drained soils. It grows well with a night-time temperature higher than 21°C and monthly rainfall ranging from 130mm to 260mm.

Agronomic and edaphic requirements

It is raised from seeds or stem cuttings and takes about six months to mature. It has some notable environmental and economic benefits.

Nutritional composition

LEAVES

Energy (kcal)	40
Calcium (mg)	212
Water (g)	87.1
Iron (mg)	5.0
Protein (g)	2.7
Zinc (mg)	0.66
Fat (g)	0.3
Vitamin A (RE) (µg)	435
Carbohydrates avail. (g)	4.5
Folate (µg)	82
Dietary fibre (g)	4.2

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 04_016)

Traditional culinary art

The leaves are cooked in tomato sauce in lamb dishes. Used puréed or in a sauce with fish. Added to salads, soups and meat or vegetable dishes. Fleshy red calyxes of roselle are commonly used for the production of soft drinks and alcohol-free tonics and wines. Also juice, jam, jelly and syrup. Dried and brewed into tea or used as a spice.

Value-added processing technologies and products

Leaves are used in the production of juice and wine.

Potential for use as livestock feed

Livestock fodder.

Potential for use as an industrial raw material

Sugary herbal tea, jam, natural colouring.


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COMMON NAME

Silver spinach

SCIENTIFIC NAME

Celosia trygina

Agroecological diversity

A small edible and ornamental annual in the amaranth family. Cultivated in northern South America, tropical Africa, east Africa, the West Indies and Asia. it occurs in open locations with full sun and moist soil at altitudes of 0–1600m.

Agronomic and edaphic requirements

Propagated from seeds, planted in fertile, well-drained soil supplemented with compost. Individuals should be spaced about 30cm apart. Attacked by white rust and Alternaria leaf spot. Harvested either by uprooting or by repeated pruning of the stem.

Nutritional composition

LEAVES

Energy (kcal)	53
Calcium (mg)	203
Water (g)	88.2
Iron (mg)	2.5
Protein (g)	4.2
Zinc (mg)	0.90
Fat (g)	1.70
Vitamin A (RE) (µg)	774
Carbohydrates avail. (g)	4.4
Folate (µg)	159
Crude fibre (g)	1.40

Source: World Vegetable Center phytonutrient data, 2023 (food codes: TWN0255, TWN0120, TWN0121)

Traditional culinary art

Leaves, young stems and young inflorescences are used for stew as they soften up readily in cooking.

Value-added processing technologies and products

Dried for later use.

Potential for use as livestock feed

Used as livestock feed.

Potential for use as an industrial raw material

Used in soaps.


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COMMON NAME

Snake gourd

SCIENTIFIC NAME

Trichosaanthes cucumerina

Agroecological diversity

A tropical or subtropical climbing vine. Altitudes below 2000 m, rainfall over 600mm and temperature range of 20–25°C.

Agronomic and edaphic requirements

Propagated by seeds. Requires well-drained sandy, loam and clay-loam soils. Pests include spider mites and thrips.

Environmental and economic benefits

Source of income for the farmers. Ornamental.

Traditional culinary art

Blended and used to produce a paste for stew.

Value added processing technologies and products

Paste.

Potential for use as an industrial raw material

Sauces and paste.


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COMMON NAME

Sorghum

SCIENTIFIC NAME

Sorghum bicolor

Agroecological diversity

Sorghum grows in a wide variety of soils and is drought resistant. It prefers deep, well-drained fertile soil with a medium to good and fairly stable rainfall pattern during the growing season (400mm annually). Temperate to warm weather in the range of 20–30°C. Cultivated on low-potential, shallow soils with high clay content with a pH (KCl) between 5.5 and 8.5.

Agronomic and edaphic requirements

Planted from seed in rows. Self-pollination and cross-pollination by wind. Seeds 15cm apart in rows 1 m apart, 3–5cm deep. Soil enrichment with compost or fertilizers is recommended before planting.

Environmental and economic benefits

Source of income to farmers. The stem is used for building materials or fuel.

Nutritional composition

DRY GRAINS

Energy (kcal)	341
Calcium (mg)	18
Water (g)	11.8
Iron (mg)	6.4
Protein (g)	10.8
Zinc (mg)	1.69
Fat (g)	3.5
Vitamin A (RE) (µg)	3
Carbohydrates avail. (g)	60.5
Folate (µg)	64
Dietary fibre (g)	11.9

Source: Kenya food composition tables, 2018 (food code: 01039)

Traditional culinary art

Flour used for porridge, ungali and busaa.

Value-added processing technologies and products

Beer, flour, bread, noodles.

Potential for use as livestock feed

Whole plant is used for forage, hay, silage, animal fodder and poultry feed.

Potential for use as an industrial raw material

Flour used in baked products and beer. Extracts used for vegetable oil, waxes and dyes.


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COMMON NAME

Soybean

SCIENTIFIC NAME

Glycine max

Agroecological diversity

Soybean is a herbaceous annual plant cultivated in east Asia, north America, Europe and Africa. It grow well at mean temperatures of 20–30°C and copes with a wide range of soils. Optimum growth occurs in moist alluvial soils of pH 6.5.

Agronomic and edaphic requirements

Propagated by seeds. Planted at depths of 3.2–4.5cm in rows spaced 30cm apart. The crop is planted after all danger of frost is past. Ready to harvest between 70 and 160 days after planting. Harvested mechanically after the leaves have fallen off the plant. Resistant to pests and diseases. Affected by bacterial blight, bacterial pustule, rhizoctonia stem rot, rust, septoria leaf blight. Pests include armyworm, cucumber beetle and Mexican bean beetle.

Environmental and economic benefits

Source of income. Foliage improves soil fertility. Nitrogen fixing.

Nutritional composition

DRY SEEDS

Energy (kcal)	381
Calcium (mg)	232
Water (g)	9.3
Iron (mg)	7.8
Protein (g)	31.3
Zinc (mg)	4.73
Fat (g)	17
Vitamin A (RE) (µg)	0
Carbohydrates avail. (g)	14.1
Folate (µg)	380
Dietary fibre (g)	23.4

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 03_008)

Traditional culinary art

Production of soy milk, soy sauce and bean paste. Soybeans are also sprouted for use as a salad ingredient or as a vegetable. May be eaten roasted as a snack food. Young soybeans, known as edamame, are commonly steamed or boiled and eaten directly from the pod.

Value-added processing technologies and products

Used to make yoghurt and ice cream.

Potential for use as livestock feed

Soybean meal is used as animal feed.

Potential for use as an industrial raw material

Extraction of soybean oil as an ingredient in paints, adhesives, fertilizers, cloth sizing, linoleum backing and soaps. Ingredient in infant formula.


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COMMON NAME

Sweet berry

SCIENTIFIC NAME

Synsepalum dulcificum

Agroecological diversity

Sweet berry is a tropical shrub cultivated in West Africa. It grows 1.8–4.5 m tall. It grows best in soils with a pH of 4.5–5.8 and likes partial shade with high humidity. It is tolerant of drought, full sunshine and slopes.

Agronomic and edaphic requirements

Propagated from seeds, which need 14 to 21 days to germinate. A spacing of 4 m between plants is required. Plants first bear fruit after growing about 3–4 years. Pests include lepidopterous larvae (which infest the leaves) and fruit fly larvae, which infest the fruits.

Traditional culinary art

Fruit pulp is used to sweeten palm wine and to improve the flavour of soured cornbread. Also used as a sweetener and flavouring agent for beverages and foods, such as beer, cocktails, vinegar and pickles.

Value-added processing technologies and products

Wine production.

Potential for use as livestock feed

Leaves and fruit byproducts fed to animals.

Potential for use as an industrial raw material

Sweetener and flavouring agent.


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COMMON NAME

Sweet bitterleaf

SCIENTIFIC NAME

Vernonia hymenolepis

Agroecological diversity

A tropical shrub found in the wild in the mountainous areas of Cameroon, Uganda, Kenya, the United Republic of Tanzania, and Ethiopia. Frequently cultivated in Cameroon. It grows along riverbeds and on the edges of forests in temperatures below 30°C. Altitude 1400–3000m. Grows well in loose, moist, humus-rich soil. Reaches a height of 75cm and produces an annual crop.

Agronomic and edaphic requirements

Propagated through seeds sown in lines spaced 15–20cm apart. Seedlings emerge in about seven days. Plants used in kitchen gardens during the rainy season are spaced at 75 × 75cm or interplanted in a mixed crop with other vegetables.

Nutritional composition

LEAVES

Energy (kcal)	-
Calcium (mg)	173
Water (g)	87.8
Iron (mg)	1.8
Protein (g)	4.5
Zinc (mg)	0.63
Fat (g)	-
Vitamin A (RE) (µg)	248
Carbohydrates avail. (g)	-
Folate (µg)	96
Crude fibre (g)	1

Source: World Vegetable Center phytonutrient data, 2023 (food code: TWN0216)

Traditional culinary art

Tender leafy shoots are eaten boiled or in soup. Or finely cut and dried to garnish other dishes.

Value-added processing technologies and products

Leaves are dried for later use.

Potential for use as livestock feed

Chicken feed.

Potential for use as an industrial raw material

Leaves dried for future use.


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COMMON NAME

Sweet potato (Yellow)

SCIENTIFIC NAME

Ipomoea batatas

Agroecological diversity

Sweet potato is grown in diverse wet agroecologies in Africa up to around 2000m above sea level. It requires adequate rainfall for optimal growth but is also drought resistant. Annual rainfall of 750–1000mm is most suitable. It grows best in fertile, well-drained sandy-clay soils of light to medium texture and pH of 4.5–7.0. The crop is sensitive to aluminium toxicity. Average temperature of 24°C.

Agronomic and edaphic requirements

Propagated by stem cuttings or adventitious roots. Sensitive to drought at the tuber initiation stage 50–60 days after planting. Attacked by sweet potato weevil, sweet potato moth, rodents and white flies. Diseases include sweet potato virus and Alternaria leaf spot. Harvested 4–7 months after planting.

Nutritional composition

TUBERS

Energy (kcal)	116
Calcium (mg)	40
Water (g)	68.9
Iron (mg)	1.9
Protein (g)	1.5
Zinc (mg)	0.54
Fat (g)	0.2
Vitamin A (RE) (µg)	255
Carbohydrates avail. (g)	25.5
Folate (µg)	52
Dietary fibre (g)	3.0

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 02_013)

LEAVES

Energy (kcal)	50
Calcium (mg)	78
Water (g)	83
Iron (mg)	3.6
Protein (g)	4.6
Zinc (mg)	0.29
Fat (g)	0.2
Vitamin A (RE) (µg)	285
Carbohydrates avail. (g)	4.9
Folate (µg)	80
Dietary fibre (g)	5.3

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 04_059)

Traditional culinary art

Boiled, baked, fried and consumed as a snack.

Value added processing technologies and products

Flour, candy, baked products.

Potential for use as livestock feed

Livestock fodder. Leaves and vines are consumed by animals.

Potential for use as an industrial raw material

Production of starch.


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COMMON NAME

Tamarillo (tree tomato)

SCIENTIFIC NAME

Cyphomandra betacea

Agroecological diversity

Subtropical environment with 600–4000mm rainfall, temperature of 15–20°C and altitudes between 1500–3000m. Grows naturally in well-drained soils with a pH of 5–8.5. Does not tolerate waterlogged soils.

Agronomic and edaphic requirements

Shallow-rooted plant requiring a fertile light soil. Propagated by seeds and cuttings, or can be grafted on a suitable rootstock. Land preparation will include ploughing at a depth of 20–30cm. Stones, weeds and debris should be removed. Well-composted organic manure (5kg/m^2) should be mixed with topsoil and allowed to equilibrate for one week before planting. Seeds are sown in lines at a spacing of 20 × 5cm and are covered with a little soil. Mulch should be applied on the bed, followed by regular watering for 10 days. The field should be kept free of weeds and the plant must be pruned when it reaches a height of about 100cm. It starts producing fruits after 10–12 months. The plant is sensitive to drought and susceptible to diseases and pests like blight, powdery mildew, whiteflies and aphids.

Environmental and economic benefits

The fruits are sold to generate income for the farmers.

Nutritional composition

FRUITS

Energy (kcal)	43
Calcium (mg)	56
Water (g)	85.6
Iron (mg)	1.0
Protein (g)	2.1
Zinc (mg)	0.4
Fat (g)	0.3
Vitamin A (RE) (µg)	91
Carbohydrates avail. (g)	4.6
Folate (µg)	63
Dietary fibre (g)	6.5

Source: Kenya food composition tables, 2018 (food code: 05037)

Traditional culinary art

Cooked as vegetables, seasoned. Used in stews, soups, salads, sandwiches and pies.

Value added processing technologies and products

Juice, wine, jam and ice cream.

Potential for use as livestock feed.

Potential for use as livestock feed

Juice processing.


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COMMON NAME

Tamarind

SCIENTIFIC NAME

Tamarindus indica

Agroecological diversity

A tropical and subtropical plant. It grows well in clay, loamy and sandy soil with a pH of 6.1–7.4. Altitude 0–2000m, annual rainfall 250–1500mm, temperature 9.5–37°C.

Agronomic and edaphic requirements

Propagated by seeds, roots and stem cutting. Seeds takes 13 days to germinate. Requires, deep, fertile, sandy, well-drained soils.

Environmental and economic benefits

Source of income for the farmers. Ornamental and cash crop in Asia.

Nutritional composition

FRUITS

Energy (kcal)	278
Calcium (mg)	166
Water (g)	26.8
Iron (mg)	3.1
Protein (g)	3.7
Zinc (mg)	0.54
Fat (g)	0.9
Vitamin A (RE) (µg)	8
Carbohydrates avail. (g)	61.3
Folate (µg)	9
Dietary fibre (g)	4.9

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 05_021)

Traditional culinary art

Fruit pulp is edible. Young fruit used as a dressing for snacks and as a component of savoury dishes, curries, chutney and sauce. Ice cream flavouring.

Value added processing technologies and products

Beverage, oil from seeds, concentrate, pectin, tartaric acid.

Potential for use as livestock feed

Seeds ground and used as an alternative source of protein for animal feed.


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COMMON NAME

Taro

SCIENTIFIC NAME

Colocasia esculenta

Agroecological diversity

Soil pH around 5.5–5.6. High humidity with annual rainfall of 1000mm. Optimum temperature around 21–27°C.

Agronomic and edaphic requirements

Taro is suitable for both wetland and dry land culture. It grows well in partial shade, making it an excellent understory plant. Planted a few centimetres below the soil surface, 60–90cm apart with 1.8m between rows. Well-drained soil enriched with plenty of organic matter. Propagated by offshoots from the mother corm or by chopping the dark top section of the taro tuber into small pieces. Crop matures in 9–12 months. Diseases are leaf blight, dry rot and leaf spot.

Environmental and economic benefits

Source of income, promotes food and nutrition security.

Nutritional composition

TUBERS

Energy (kcal)	127
Calcium (mg)	26
Water (g)	65.9
Iron (mg)	1.6
Protein (g)	2.7
Zinc (mg)	0.61
Fat (g)	0.8
Vitamin A (RE) (µg)	4
Carbohydrates avail. (g)	25.2
Folate (µg)	22
Dietary fibre (g)	4.1

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 02_015)

LEAVES

Energy (kcal)	39
Calcium (mg)	190
Water (g)	86.6
Iron (mg)	1.5
Protein (g)	2.5
Zinc (mg)	0.39
Fat (g)	0.8
Vitamin A (RE) (µg)	300
Carbohydrates avail. (g)	2.6
Folate (µg)	130
Dietary fibre (g)	5.6

Source: FAO/Infoods food composition table for western Africa, 2019 (food code: 04_020)


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COMMON NAME

Teff

SCIENTIFIC NAME

Eragrostis tef

Agroecological diversity

A warm-season annual grass cultivated in Ethiopia and Eritrea. Has a large crown and many tillers. Prefers altitudes of 1800–2100m, a daily temperature range of 15–27°C and annual rainfall below 250mm. Cultivated in pH-neutral soils.

Agronomic and edaphic requirements

Can reproduce from seeds. Crop matures within 45–65 days. Tolerant to disease and pests. Common diseases are fungal.

Environmental and economic benefits

Feed for livestock. Building material. Control of soil erosion.

Nutritional composition

DRY GRAINS

Energy (kcal)	351
Calcium (mg)	180
Water (g)	8.8
Iron (mg)	7.6
Protein (g)	13.3
Zinc (mg)	3.63
Fat (g)	2.4
Vitamin A (RE) (µg)	1
Carbohydrates avail. (g)	65.1
Folate (µg)	-
Dietary fibre (g)	8.0

Source: USDA national nutrient database for standard reference, Legacy database, 2019 (food code: 169747)

Traditional culinary art

Ground into flour, fermented and used to prepare flat bread in Ethiopia. Eaten with meat or ground pulses. Eaten as porridge.

Value-added processing technologies and products

Grains used to prepare alcoholic beverages or beer.

Potential for use as livestock feed

Livestock feed.

Potential for use as an industrial raw material

Ingredient in baby food.


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COMMON NAME

Tigernut

SCIENTIFIC NAME

Cyperus esculentus

Agroecological diversity

A perennial plant cultivated for its edible tubers (nuts). Tigernut grows in low-lying wetlands, preferably with shade and cool temperatures. Light intensity can inhibit flowering. Grows best in sandy, moist soils rich in organic matter and with a pH between 5.0 and 7.5. It can thrive under adverse conditions such as drought, flooding and heat.

Agronomic and edaphic requirements

It is planted on ridges in rows with furrow irrigation. Planting depth of 6–8 cm at 15–29 cm spacing between ridges. Propagated using seed (tubers) or rhizomes. The plants start forming between 6 to 8 weeks after sprouting. The nuts or tubers mature and are ready for harvest 12–16 weeks after germination.

Environmental and economic benefits

Extraction of oil of high economic value. Boiled nuts used as fishing bait.

Traditional culinary art

Eaten raw as a vegetable. Roasted and eaten as a snack. Dried and ground into flour for ice cream, milk drinks and porridge. Widely consumed as a sweetmeat or a side dish in Africa.

Value-added processing technologies and products

Dried, roasted and ground into flour for baked products such as cookies and cakes. Can be made into a refreshing beverage.

Potential for use as livestock feed

Byproducts are used in animal feed.

Potential for use as an industrial raw material

Extraction of oil for making soap. Starch extract. Flavouring agent in ice cream.


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COMMON NAME

Turkey berry

SCIENTIFIC NAME

Solanum torvum

Agroecological diversity

A bushy perennial tropical and subtropical plant. It prefers annual rainfall of 1000–2000mm but will also grow in riparian zones in drier areas. All types of moist, fertile soil at elevations from near sea level to almost 1000m.

Environmental and economic benefits

Source of income for farmers. Ornament. Improvement of human and livestock diets. Creation of new food industries.

Nutritional composition

FRUITS

Energy (kcal)	-
Calcium (mg)	82
Water (g)	79.6
Iron (mg)	1.0
Protein (g)	2.7
Zinc (mg)	-
Fat (g)	4.50
Vitamin A (RE) (µg)	27
Carbohydrates avail. (g)	-
Folate (µg)	-
Crude fibre (g)	7.2

Source: World Vegetable Center phytonutrient data, 2023 (food code: TWN0063)

Traditional culinary art

Incorporated in soups and sauces. Fruit consumed directly or cooked as food.

Value added processing technologies and products

Processed to produce sauces.

Potential for use as an industrial raw material

Production of sauces.


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COMMON NAME

Watermelon

SCIENTIFIC NAME

Citrullus lanatus

Agroecological diversity

Watermelon grows in tropical and temperate climates with temperatures above 25°C and well-drained sandy loam soil with a pH of 5.5–7.

Agronomic and edaphic requirements

Plants mature within 100 days of planting. Propagated by seed. Pests include aphids, fruit flies and nematodes. Diseases include powdery mildew and mosaic virus.

Environmental and economic benefits

Source of income for farmers. Used by wild animals for both water and nourishment.

Nutritional composition

FRUITS

Energy (kcal)	25
Calcium (mg)	7
Water (g)	93.1
Iron (mg)	0.3
Protein (g)	0.5
Zinc (mg)	0.1
Fat (g)	0.1
Vitamin A (RE) (µg)	50
Carbohydrates avail. (g)	5
Folate (µg)	8
Dietary fibre, total (g)	0.9

Source: FAO/INFOODS Food Composition Table for Western Africa, 2019 (food code: 05_022)

Traditional culinary art

Eaten raw as a vegetable on its own or in salads. Made into juice. Can be pickled.

Value-added processing technologies and products

Juice, wine, pickles, jam.

Potential for use as livestock feed

Foliage used for livestock. Byproducts given to cattle.

Potential for use as an industrial raw material

Fruit used in juice processing. Oil extracted from seeds used to make cosmetics.


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COMMON NAME

Water yam

SCIENTIFIC NAME

Dioscorea alata

Agroecological diversity

Prefers well-drained fields, sandy loam and silt loam soil. Drought-resistant but requires ample moisture during the growing period, particularly from 14 to 20 weeks after planting. Temperature range 25–3°C. Elevation above 900 m.

Agronomic and edaphic requirements

Propagated using sprouted tubers. Soil is mulched and inorganic fertilizer is applied one month after planting. Compost manure is applied during field preparation. Harvested when its foliage is already yellowing or drying up.

Environmental and economic benefits

Source of income. Used as staple or famine food.

Nutritional composition

TUBERS

Energy (kcal)	116
Calcium (mg)	15
Water (g)	65
Iron (mg)	0.8
Protein (g)	24
Zinc (mg)	0.43
Fat (g)	0.1
Vitamin A (RE) (µg)	7
Carbohydrates avail. (g)	21.6
Folate (µg)	26
Dietary fibre (g)	9.7

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 02_017)

Traditional culinary art

Cooked as a vegetable. Boiled and mashed into a sticky paste. Also fried, roasted and baked.

Value added processing technologies and products

Tubers are dried and ground into flour for baked products.

Potential for use as livestock feed

Leaves used as fodder.

Potential for use as an industrial raw material

Used in baked products.


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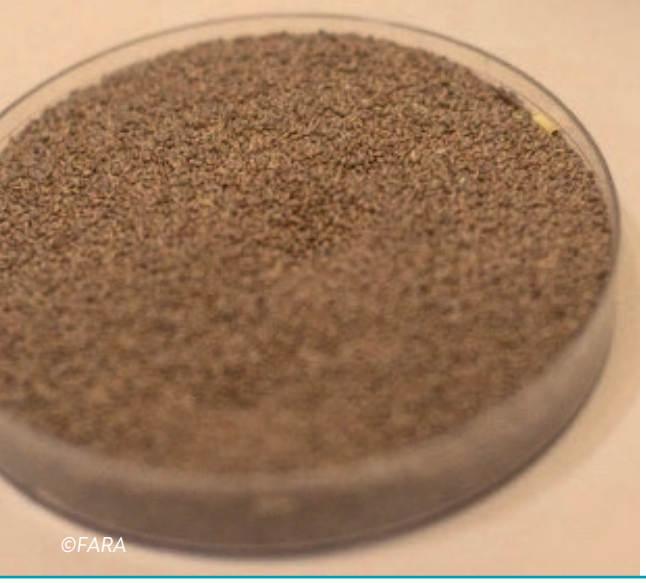
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COMMON NAME

White fonio

SCIENTIFIC NAME

Digitaria exilis

Agroecological diversity

White fonio is cultivated from Senegal to Chad and black fonio is grown mainly in Nigeria as well as in the northern regions of Togo and Benin. A drought-tolerant tropical plant that grows in savannahs and in poor, shallow, sandy or rocky soils unsuitable for other cereals. It does not prosper in saline or heavy soils. Annual rainfall of 150–3000mm.

Agronomic and edaphic requirements

Propagated form seeds. Plants mature 60–70 days after sowing. Attacked by shoot flies, stem borers, thrips, bugs and grasshoppers.

Environmental and economic benefits

Source of income. Staple food. Animal feed.

Nutritional composition

DRY GRAINS

Energy (kcal)	356
Calcium (mg)	24
Water (g)	10.9
Iron (mg)	2.1
Protein (g)	7.1
Zinc (mg)	1.71
Fat (g)	1.7
Vitamin A (RE) (µg)	0
Carbohydrates avail. (g)	76.9
Folate (µg)	62
Dietary fibre (g)	2.2

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 01_050)

Traditional culinary art

Seeds are cooked and used as a staple food in west Africa. Ground into a flour and made into bread or eaten like couscous. Unfermented flour can be made into thick porridge while fermented grains are used for making a thin porridge. The whole seed can be popped like popcorn.

Value-added processing technologies and products

Flour and grains used in local beer brewing in western Kenya.

Potential for use as livestock feed

Seeds used in poultry feed. Stem and leaves fed to livestock.

Potential for use as an industrial raw material

Seeds can be processed into flour or popped.


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COMMON NAME

White sapote

SCIENTIFIC NAME

Casimiroa edulis

Agroecological diversity

White sapote is a tropical fruit with dense, glossy and bright green leaves. It grows at altitudes of 600–900m and favours temperatures around 18°C. It does well in sandy loam or clay soil with good drainage.

Agronomic and edaphic requirements

Propagated using seeds. Takes 7–8 years to bear fruit.

Environmental and economic benefits

Source of income for farmers; seeds used as insecticide.

Nutritional composition

FRUITS

Energy (kcal)	76
Calcium (mg)	13
Water (g)	79.0
Iron (mg)	0.2
Protein (g)	1.5
Zinc (mg)	0.20
Fat (g)	0.1
Vitamin A (RE) (µg)	2
Carbohydrates avail. (g)	15.8
Folate (µg)	36
Dietary fibre (g)	3.1

Source: The standard tables of food composition in Japan, 2015 (food code: 07128)

Traditional culinary art

Preserves, salads, desserts, ice cream.

Value added processing technologies and products

Jam, fruit juices, yoghurt, cookies.

Potential for use as an industrial raw material

Jam and fruit juices.


©https://www.gaiaherbs.com/blogs/herbs/wild-lettuce

COMMON NAME

Wild lettuce

SCIENTIFIC NAME

Launaea taraxacifolia

Agroecological diversity

Wild lettuce is a herb found in tropical Africa, west Africa and the coastal zones of Kenya and the United Republic of Tanzania. It prefers sandy soils in a relatively dry locality. Loams and black cotton soil. Tolerates poor soils with a low water table.

Agronomic and edaphic requirements

Propagated vegetatively through rhizomes.

Environmental and economic benefits

Mosquito repellant.

Traditional culinary art

Cooked and eaten with amaranth and pumpkin. Eaten fresh as a salad or cooked in soups and sauces. Has a bitter taste.

Value-added processing technologies and products

Dried for future use.

Potential for use as livestock feed

Fodder for rabbits and sheep. Given to cows to increase milk yield.

Potential for use as an industrial raw material

Production of latex.


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COMMON NAME

Yam

SCIENTIFIC NAME

Dioscorea spp

Agroecological diversity

Yams require a temperature of 25–30°C, rainfall of 100–180cm per annum and abundant sunshine. They grow best in friable, drained, sandy-loamy soil, rich in humus.

Agronomic and edaphic requirements

Propagated by yam setts, yam seeds or yam mini setts. Cut yam setts should be dried under the sun and dusted with chemicals such as aldrin before planting to prevent rotting and pest attack.

Environmental and economic benefits

Source of income for farmers.

Nutritional composition

TUBERS

Energy (kcal)	126
Calcium (mg)	26
Water (g)	64.4
Iron (mg)	1.6
Protein (g)	2.3
Zinc (mg)	0.64
Fat (g)	0.4
Vitamin A (RE) (µg)	7
Carbohydrates avail. (g)	25.5
Folate (µg)	27
Dietary fibre (g)	5.6

Source: FAO/INFOODS food composition table for western Africa, 2019 (food code: 02_019)

Traditional culinary art

Tubers are boiled, baked or fried.

Value added processing technologies and products

Dried and ground into flour for use in baked products.

Potential for use as livestock feed

Can be used as animal feed.

Potential for use as an industrial raw material

Flour used in baked products.

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