

Economic Importance Of Spices For Sustainable Livelihood And Development

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Abstract: Availability of spices is under increasing pressure due to urban development, expansion and over-use of chemicals and pesticides. The increasing pressure on the Nigerian forest today results from increase in the demand for forest resources and forest products. Spices are dried seeds, fruits, berries, leaves, roots or barks of plants grown as herbs, shrubs, climbers and trees, used to enhance the flavor of foods. This paper therefore reviews the economic importance of spices for sustainable livelihood and development.

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1. Introduction

Economic Botany is the commercial exploitation of plants by people. It is the study of plants of economic value. A plant is considered to be of economic value either by virtue of its usefulness in whatever form, or by its negative attributes militating against other factors affecting man or the ecosystem generally.

Simply, economic botany is the interaction of people with plants. Economic botany contributes significantly to Anthropology, biology, conservation, botany and other field of science. This link between botany and anthropology explores the ways humans use plants for food, shelter, medicines, textiles, and much more (Levetin and Karen, 2008; Prindle T. 2009). These basic needs are supplied by nature and subsequently improved upon by nature and subsequently improved upon by man.

Many economic plants occur in natural state (wild and uncultivated), most especially in the forest, while a good number are cultivated food and industry.

Economic plants are defined as those plants utilized either directly or indirectly for the benefit of man. Indirect usage includes the needs of man's livestock and the maintenance of the environment, the benefit may be domestics, commercial, environmental or aesthetic.

2. Classification of Plants.

Many plants are used for a number of varied purposes and different uses are continually evolved for different plants so much that some formally inconspicuous plants become promoted because of their discovered essential use(s). Nevertheless, plants are group into two major lines. (Botanical and Agronomic).

3. Botanical Classification.

This is based on seed and seedless plants called Spermatophytes which are: Angiosperms and Gymnosperms respectively.

IV Agronomic Classification

Many plants are classified according to the product from the plant and or their use, rather than any form of character similarity. They are cereal crops, Grains, Root tubers, Legumes, Vegetables, Sugar crops, Forage, Fruit crops, Oil crops, Nut crops, Rubber, Timber or tree crops, Fibre crops, Spices and Stimulants.

V Spices

These are flavoring agents obtained from plants. They are dried seed, fruits, root, bark or vegetative substances primarily used for flavouring, colouring, sometimes, a spice is used to hide other flavours (Gill, (2010): USDA, 2012; Ninfali, et al 2007)

Many spices have antimicrobial properties. This may explain why spices are more commonly used in warmer climates which have more infectious diseases and why use of spices is especially prominent in meat, which is particularly susceptible to spoiling (Gill, 2010; Linda 2007; Adamson and Melluta, 2004)

A spice may have an extra use, usually, medicinal, Religious, ritual, cosmetics or perfume production, or as a vegetable. For example, turmeric roots are consumed as a vegetable and garlic as an antibiotic.

Spices contain essential oils, which impart flavour and aroma to food and add greatly to the pleasure of eating. They stimulate the appetite and increase the flow of gastric juices. For these reasons they are often referred to as "FOOD ACCESSORIES" or ADJUNCTS.

VI History of Spices

Humans were using spices in 50,000 BCE: The spices trade developed throughout South Asia and middle East in around 2000 BCE with Cinnamon and pepper, and in East Asia with herbs and pepper. The Egyptians used herbs (*Cassia and Cinnamon*) for embalming and their need for exotic herbs helped stimulate world trade. The old French word *espice*, which became *epice*, and which came from the Latin root *spic*, the noun referring to appearance, sort, kind. By 1000BCE, medical system based upon herbs could be found in China, Korea, and India. Early uses were connected with magic, medicine, religion, tradition and preservation (Gill, 2010; Linda 2007; International organization for standardization 2009).

Archaeological excavations have uncovered clove burnt onto the floor of a kitchen, dated to 1700BCE at the Mesopotamian site of Terga, in modern-day Syria (FAO, 2012; Linda 2007; Adamson and Melluta, 2004). The ancient Indian epic Ramayana mentions cloves. The Romans had cloves in the first century CE, as Pliny the Elder wrote about them.

In the story of “Genesis”, Joseph was sold into slavery by his brothers to spice merchants. In the biblical poem “Song of Solomon”, the male speaker compares his beloved to many forms of spices. Generally, early Egyptian, Chinese, Indian, and Mesopotamian sources do not refer to known spices.

In South Asia, nutmeg, which originates from the Banda Islands in the Molukas has a sanskrit name (ancient language of India, showing how old the usage of this spice in this region. Nutmeg was introduced to Europe in the 6th century BC (Czara, 2009; Turner, 2004).

Spices were among the most demanded and expensive products available in Europe in the middle ages, the common being black pepper, Cinnamon (the cheaper alternative Cassia), Cumin, nutmeg, ginger and cloves.

VII Availability Of Spices

A spice may be available in several forms: fresh, whole, dried, or pre-ground dried. Generally, spices are dried (FAO, 2012; Linda, 2007; Adamson and Melluta, 2004). A whole dried spice has longest shelf life, so it can be purchased and stored in larger amounts, making it cheaper on a preserving basis. Some spices are rarely available either fresh or whole, for example Turmeric which is often purchased in ground form.

Small seeds, such as Fennel and Mustard seeds, are used both whole and in powder form, grinding a spice greatly increases its surface area and so increases the rate of oxidation and evaporation. Thus, flavour is maximized by storing a spice whole and

grinding when needed. The shelf life of a whole spice is roughly 2 years; of a ground spices roughly six months (Czara, 2009; Turner, 2004; Freedman, 2008).

The “flavour life” of a ground spice can be much shorter. Ground spices are better stored away from light. To grind a whole spice, the classic tool is mortar and pestle. Less labour intensive tools are more common now: microplane or fine grater can be used to grind small amounts; a coffee grinder such as bull mill is useful for larger amounts. Some flavour elements in spices are soluble in water; many are soluble in oil or fat. As a general rule, the flavours from a spice take time to infuse into the food, so spices are added early in preparation (Czara, 2009; Turner, 2004; Freedman, 2008; Kaey, 2006).

VIII Nutrition Of Spices

Because they tend to have strong flavours and are used in small quantities, spices tend to add few calories to food, even though, many made, especially those made from seeds contain high portions of fat, proteins, and carbohydrate by weight.

Many spices, however, can contribute significant portions of micronutrients to the diet. For example a teaspoon of *Paprika* contains about 1133IU of vitamin A which is 20% of the recommended daily allowance specified by the USFDA (USDA, 2012). When used in larger quantity, spices can also contribute a substantial amount of minerals including Iron, Magnesium, Calcium, and many others to the diet.

Spices have substantial antioxidant activity, owing primarily to phenolic compounds, especially flavonoids, which influence nutrition through many pathways including affecting the absorption of other nutrients. One study found *Cumin* and fresh ginger to be highest in anti-oxidant activity (Ninfali, et al. 2007). These anti-oxidants also can act as natural preservatives, preventing or slowing the spoilage of food, leading to a higher nutritional content in stored food.

IX Production Of Spices

It may be interesting to note that the spices namely pepper, ginger, clove, Cinnamon, cassia mace, nutmeg, *pimento* (allspice) cardamom, and Aframomum alone contributed as much as 90% of the total world trade. Pepper is the most important spice in the world and so also of India (Dalby, 2002).

India is the largest producer, consumer and exporter of spices in the world (Panda, 2010) India produces 70% of global spice production.

X Spice And Its Importance

Spice is an aromatic or pungent, vegetable substances used to flavor food such as clove, pepper or mace.

Health was believed to depend on a balance of four fluids or "humours" in the body and correct spicing of foods was important to retaining or rectifying the balance of the humours.

Spices can improve palatability and the appeal of dull diets or spoiled food. Piquant flavors stimulate

salivation and promote digestion. Pungent spices can cause sweating which may even cause a cooling sensation in tropical climates, on the other hand, they can add a sense of inner warmth when present in cooked foods used in cold climates specific health benefits highlighted include improving motor skills, preventing memory loss, lowering blood pressure and fighting the wrinkles.

Table 1: Top 10 countries produce in 2010.

Country	Production(Tones)	Foot Note
India	1,051,000	1M
Bangladesh	128,517	-
Turkey	107,000*	-
China	81,600	1M
Pakistan	53,647	-
Nepal	20,400	1M
Colombia	14,900	1M
Iran	11,500	1M
Burkina Faso	5,200	1M
Sri Lanka	5,200	1M

World, 1,545,734A. A= may include official semi-official or estimated data.

*= Unofficial figure. 1M=FAO data based on imputation methodology.

Source: (FAO, 2012)

Table 2: Pverview of spices, botanical name and medicinal properties

Botanical Name	Spices Common name	Family	Medicinal properties	Uses	Benefits
Ferula spp	Asafetida	Apiaceae	Carminative	Seasoning food	Remedy for whooping cough, stomach ache due to gas
Laurus nobilis	Bay leaf	Lauraceae	Stimulant narcotic	Cooking for flavor	Anti-fungal and anti-bacterial
Ocimum basilicum	B-Basil	Labiatae	Stomachic, diaphoretic, expectorant, antipyretic, anthelmintic, stimulant, diuretic	Cooking	Used on skin infections & insect bites, source of iron, calcium, magnesium & potassium, helps the eye sight, cardiovascular system & the hair
Elettaria cardamomum	Cardamom		Digestive	Good flavor	Controls bad breath and digestive disorder, control diabetes
Capsicum spp.	Chili	Solanaceae	Antioxidant	Hot flavor	Anti-oxidant
Cinnamomum zeylanica	Cinnamon	Lauraceae	Anti asmaic	Seasoning food	Support natural production of insulin, reduces blood cholesterol.
Syzgium aromaticum	Clove	myristaceae	Tropical anaesthetic, anti-dyspeptic	Seasoning	Tooth ache (oil) sore gum, chest pain and cold
Coriandrum sativum	Corlander	Apiaceae	Carminative, diuretic, tonic, stimulant.	Cooking seed and leafs	Externally on aching joints & rheumatism, sore throats, allergies, digestion problems, hay

Botanical Name	Spices Common name	Family	Medicinal properties	Uses	Benefits
					fever.
Cuminum cyminum	Cumin	Umbeliferae	Anti-microbial, vermifuge, diuretic carminative	Cooking	Source of iron, keeps immune system healthy, water boiled with cumin seeds is good for dysentery.
Murayako enigi	Curry leaf	Rutaceae	Antiemetic	Main seasoning ingredients	Reducing blood sugar
Foenum graecum	fenugreek	Papilionaceae	Hypoglycemics,	Seasoning seeds	Increase breast milk lowering cholesterol, treating diabetes
Allium sativum	Garlic	Alliaceae	Anti-emetic, anti-rheumatic	Cooking	Cough and cold, antibiotic properties
Zingiber officinales	Ginger	Zingiberaceae	Counter irritant, emetic, purgative	Specific flavor to food	Avoids digestive problems, beneficial for cough.
Brassica nigra	Mustard	Brasicaceae		Seasoning (leaf vegetable)	Oil is for body massage, getting good hair, it consists of omega fatty acid, excellent source of iron, calcium, manganese, zinc protein e.t.c
Myristica fragrans	Nutmeg	Myristicaceae	Used in soap making. Perfumes, shampoos, treatment of asthma, heart disorder and bad breath	Used in soap making. Perfumes, shampoos, treatment of asthma, heart disorder and bad breath	Powdered form for garnishing food
Capsicum fruitcens	Pepper	Solonaceae	Has many medicinal uses: coping with cold, cough, infections e.t.c deals with much pain & digestive problem	Has many medicinal uses: coping with cold, cough, infections e.t.c deals with much pain & digestive problem	Cooking in garnishing foods
Crocus saturus	Saffron		Cope with skin diseases remedy for cough, cold and asthma	Cope with skin diseases remedy for cough, cold and asthma	Cooking, beautify products, sweet dishes
Cucuma longa	Turmeric	Zingiberceae	Used in skin problems, turmeric powder for healing cuts and wounds makes diabetes easier	Used in skin problems, turmeric powder for healing cuts and wounds makes diabetes easier	Cooking and skin care products
Allium cepa	Onion	Alliaceae	Hypoglycemic		Cooking
Thymes vulgaris	Thyme	Lamiaceae	Carminative		Cooking
Wasabia japonica	Wasabi		Coping with cold and cough	Coping with cold and cough	Cooking

XI Spices As Source Of Chemicals And Essential Oils.

Fragrances are complex combination of natural and man made substances that are added to product to give them a distinctive smell. They are added to enhance the experience of using the product. Liquid or semi-liquid form, non-miscible in water, aromatical mixtures. Plants essential oils are oils that are very concentrated, active and very rich in chemical structure. The chemical and essential oils extracted from plant can differ based on the region that the plant grows. Perfume, eau de toilette cleaners, personal hygiene products and many others

are areas where fragrances are utilized in large quantities

Essential oils can also be used in medical usage or for healing effects. Cinnamomum is used in the food industry as a spice for flavoring various foods such as prickles cakes, cakes and biscuit in food preservation and in the soap industry fats obtained for candle.

Pure essential oils and spice oils are used in cosmetics, aromatherapy, provide comfort and relaxation to our mind and body. Gamut of this product includes the following. (Table 3)

Table 3: List of spices as essential oils

Spices (essential oil)	Botanical name	Family
Eucalyptus oil	<i>Eucalyptus olida/ straigeriana</i>	Myrtaceae
Lemon grass	<i>Cymbopogon citrates</i>	Poaceae
Sandal wood oil	<i>Santalum album</i>	Santalaceae
Cardamom oil	<i>Elettaria cardamomun</i>	Zingiberaceae
Celery seed oil	<i>Apium graveolens</i>	
Lavender	<i>Lavandula spp</i>	Labiatae
Cumin	<i>Cuminum cyminum</i>	Umbeliferac
Juniper berry oil	<i>Juniperus communis</i>	Cupresaceae
Castor oil		Euphorbiaceae
Neem oil	<i>Azadiractha indica</i>	Meliaceae
Groundnut oil	<i>Arachis hypogea</i>	

In conclusion, though spices provide innumerable benefits, they should be used sparingly. The excessive use of spices in food can cause harm to the health. Strike the balance and add some spices to your life.

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