UNIT-8

Role of medicinal and aromatic plants in national economy and their export potential

Points to be covered in this topic

- ❑ INTRODUCTION
- ❑ INDIAN MEDICINAL AND AROMATIC PLANT TRADE IN WORLD SCENARIO
- ❑ INTERNATIONAL TRADE
- ❑ EXPORT POTENTIAL OF INDIA IN MEDICINAL AND AROMATIC PRODUCTS

8.1 INTRODUCTION

Medicinal and aromatic plants are plants that are cultivated or harvested for their therapeutic or aromatic properties. These plants contain various bioactive compounds that have medicinal or healing effects on the human body. They have been used for centuries in traditional medicine systems, such as Ayurveda, Traditional Chinese Medicine, and Indigenous healing practices. People in India and China are known to have used plants in organized health care regime for over 5,000 years. The ancient civilization of India, China, Greece, Arab and other countries of the world developed their own systems of medicine independent of each other, but all of them were predominantly plant

based. History teaches us that since prehistoric times, plants have been a vital global natural resource. One of the oldest repositories of human knowledge, the Rig Veda (4500–4600 B.C.) mentioned the use of medicinal plants for the treatment of one or other disease.

(a) Medicinal plants

These are used to treat or alleviate symptoms of various diseases and conditions. They can be used in the form of herbal teas, tinctures, extracts, capsules, or as ingredients in topical preparations. Some well-known examples of medicinal plants include aloe vera, ginseng, turmeric, chamomile, and echinacea. 80% of people in developing nations, according to estimates from the World Health Organization (WHO), rely on traditional medicines. At least 25% of medications in the current pharmacopoeia are still sourced from plants, and many more are semisynthetic medications based on plant-derived prototype compounds. Global demand for herbal medications is rising as more people become aware of the benefits of natural plant-based products, they are safe, easy to find at reasonable prices, and occasionally the only source of healthcare available to the underprivileged.

Table 8.1: List of high market potential medicinal plants

PLANT		PLANT	
Allium sativum (Liliaceae)		*Gymnema sylvestre* (Asclepiadaceae)	

Asparagus racemosus (Liliaceae)		***Holarrhena antidysenterica*** (Apocynaceae)	
Azadirachta indica (Meliaceae)		***Nardostachys jatamansi*** (Valerianaceae)	
Berberis aristata (Berberidaceae)		***Picrorrhiza kurroa*** (Scrophulariaceae)	
Commiphora wightii (Burseraceae)		***Plantago ovata*** (Plantaginaceae)	
Embelica officinalis (Euphorbiaceae)		***Withania somnifera*** (Solanaceae)	

(a) Aromatic plants:

Aromatic plants are those that contain aromatic compounds, basically essential oils that are volatile at room temperature. These are valued for their pleasant fragrance and are often used in perfumes, cosmetics, and aromatherapy. Aromatic plants are plants that produce substances with a particular fragrance. They are often used for cooking, making essences, cosmetics and more. They are also popular for their medicinal properties. Essential oils extracted from aromatic plants are highly concentrated and possess distinct aromas that can have therapeutic effects on the mind and body. Examples of aromatic plants include lavender, rosemary, peppermint, and jasmine. More than 9,000 native plants have established and recorded curative properties and about 1500 species are known for their aroma and flavour.

Table 8.2: List of high market potential aromatic plants

PLANT	IMAGES	PLANT	IMAGES
Aloevera (Liliaceae)		***Rosa damascena*** (Rosaceae)	
Pelargonium graveolens (Geraniaceae)		***Matricaria chamomilla*** (Asteraceae)	
Ocimum basilicum (Lamiaceae)		***Lawsonia inermis*** (Lythraceae)	
Hibiscus rosa-sinensis (Malvaceae)		***Mentha piperita*** (Labiatae)	

8.2 INDIAN MEDICINAL AND AROMATIC PLANT TRADE IN WORLD SCENARIO

Roughly 90% of the industrialized world's medicinal plant supply comes from wild sources.

Only about 20 species of plants are cultivated for commercial purposes, despite the fact that industries use over 800 species. Because of the utilization of elements including roots, bark, stems, wood, and entire plants (in the case of herbs), more than 70% of plant collections included destructive harvesting.

If the biodiversity is not used sustainably, this process possesses a serious threat to the genetic diversity and stock of medicinal plant resources, which could ultimately affect the nation's economy.

The 1622 herbal raw drug entities recorded in commercial demand pertain to different parts of the plants, including whole plants. Part-wise analysis of the 1622 herbal raw drug entities.

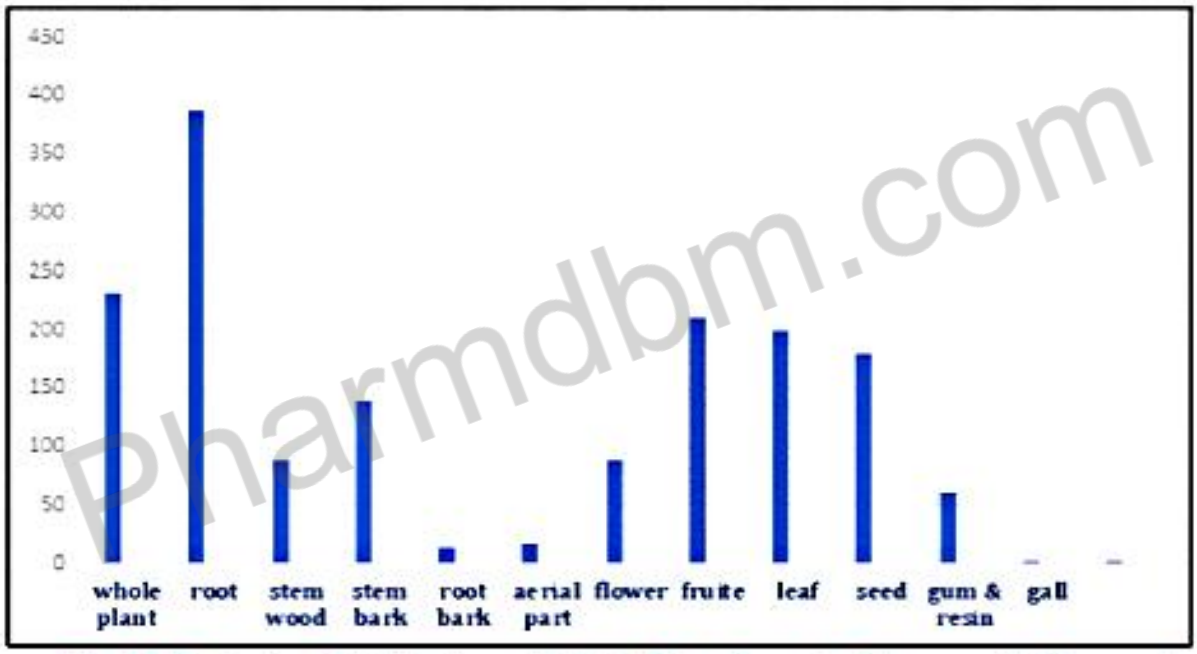

Fig 8.1:Part-wise Distribution of Herbal Raw Drugs in Commercial Demand

Area and production of medicinal and aromatic crops in India:

Data on the area and production of aromatic and medicinal crops were gathered between 2005–06 to 2015–16. With an annual growth rate of 1.12%, the area planted to these crops has expanded year over year.

Cultivation of medicinal and aromatic crops has increased from 2, 62, 000 hectares during 2005-06 to 6, 33, 900 hectares in 2015-16. With a share of 44% in output, Madhya Pradesh is ranked first, followed by Rajasthan with a share of 19%.

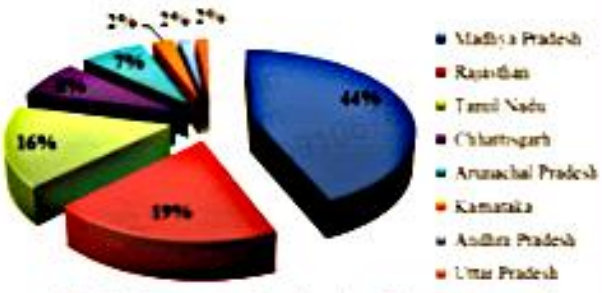

Fig 8.2:State wise Production of Aromatic and Medicinal plants

States have the following shares: Arunachal Pradesh, Chhattisgarh, and Tamil Nadu, with 7%, 8%, and 16% of the total.

The utilization of herbal drugs is increasing steadily, leading to the growth of the market. In India, the annual turnover of the herbal medicinal industry is around **Rs 2300 crore**, compared to **Rs 14,500 crore** turnover of the pharmaceutical industry. The herbal medicine industry has a growth rate of 15%. 10,000 licensed pharmacies manufacturing plant-based drugs.

India also exports a significant amount of medicinal plants and herbs. It is recognized as the second largest producer in castor seeds worldwide with an annual production capacity of about **125,000 tonnes.**

Some major pharmaceutical products exported by India include isabgol (Psyllium husk), opium alkaloids, senna derivatives (stimulant laxatives), vinca extract (used in chemotherapy treatments), cinchona alkaloids (used for malaria treatment), ipecac root alkaloids (emetic used in medical emergencies like poisoning), solasodine, diosgenin/16DPA (steroidal compounds used for hormone production) among others.

The turnover generated from over-the-counter products and classical formulations using traditional systems such as Ayurveda and home remedies stands at about **US$1 billion** within India itself.

The cultivation of essential oil-bearing plants has gained importance due to increased consumer preference for natural materials and rising health concerns associated with synthetic chemicals. India's varied agro-climatic zones make it suitable for cultivating a wide range of essential oil-bearing plants.

Institutional efforts to enhance marketing and exports of MAPs from India: The Government of India has set up a national level body namely **National Medicinal Plants Board (NMPB)** with a view to ensuring availability of medicinal plants and to coordinate all matters relating to their development and sustainable use. The NMPB is conducting schemes on cultivation and marketing of medicinal and aromatic plants in the country.

Presently, essential oils account for almost 30% of the fine chemicals used in tastes and perfumes in India. Every year, about 3800 MT of flavoring and aroma ingredients worth Rs 100 crore are consumed.

It is anticipated that 500 tonnes of raw materials for perfumery are produced annually, with a value of Rs 400 crore. The 700 MT portion of tastes that are related to food, dentistry, and pharmaceuticals is shared by perfumery.

The major buyers of Indian essential oils being Russia, United States, Spain, Morocco, Germany, Australia, France, UK, Netherlands, UAE, Saudi Arabia, Pakistan, Korea, Taiwan, etc.

India's domestic demand for medicinal plants is projected to be 1,95,000 MT in 2014–15. For 2014–15, the nation's total consumption of herbal raw drugs has been estimated at 5, 12,000 MT. Additionally, it is stated that the cultivation of medicinal plants provides for around 22% of the total production (NMPB, 2019).

India is the 2nd largest exporter of herbal medicines only after China, both the countries producing over 70 percent of the herbal medicines demand across the globe. India's raw herb exports to the US came to USD 330.18 million in 2017–18, a 14.22% increase from the previous year.

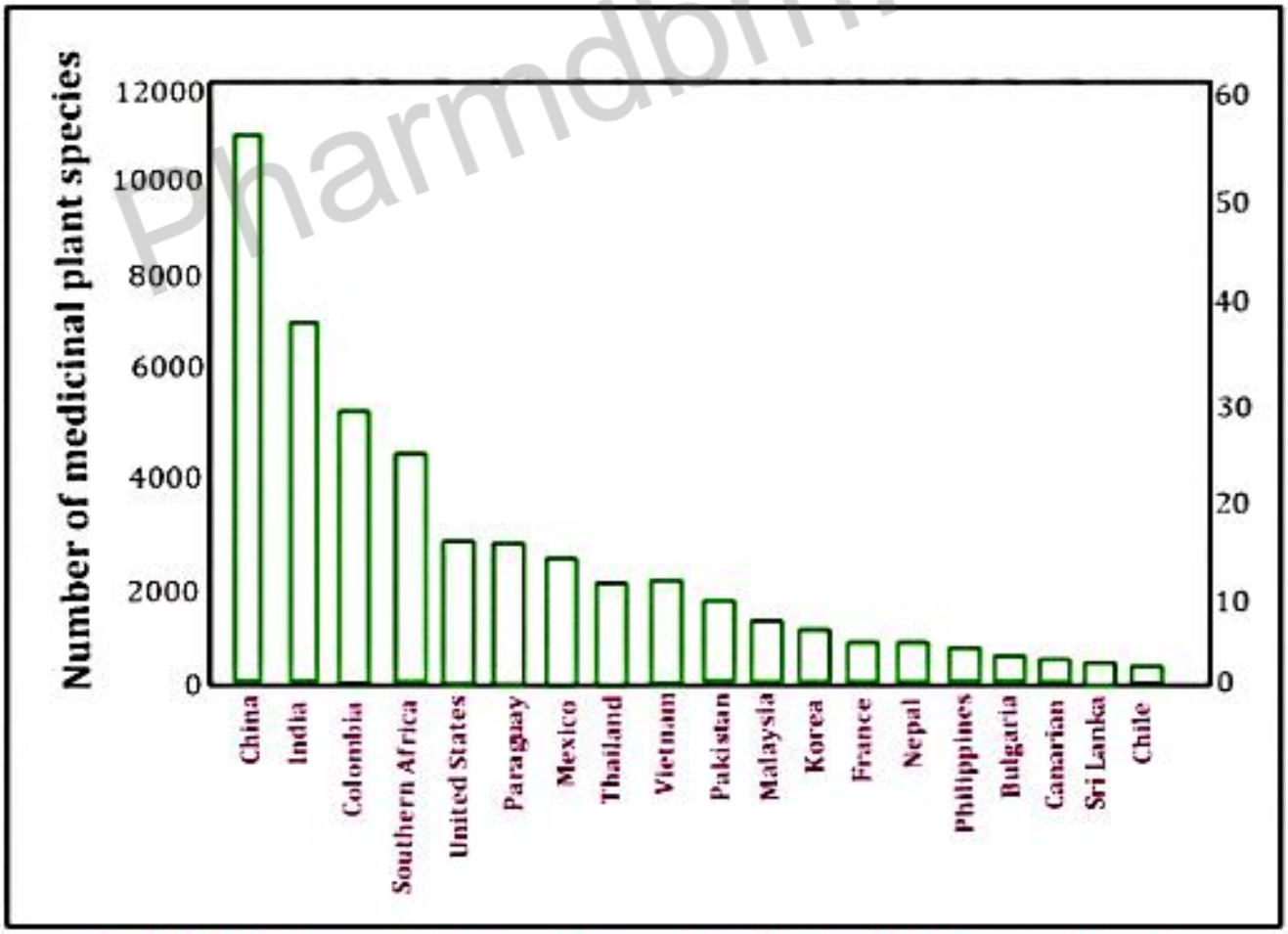

Fig 8.3:Number and percentage of medicinal plant species in different countries

By critically examining the above graphic, it is possible to conclude that while China has the greatest number of plant species when compared to other nations, India has the greatest number of species with medicinal potential. There's a saying that every plant that grows in India's forests or elsewhere has some sort of therapeutic value, based presumably just on this. The only issue is that not all plants with medical value have been properly documented.

8.3 INTERNATIONAL TRADE

Medicinal plants and other forest products have an impact on local, national, and international economies. For example, Nepal earns an estimated US$ 8.6 million a year from the export of medicinal plants. The economic significance of the international trade in medicinal plants is growing, affecting not only South Asian countries but also East Asian, European, and North American countries.

The last ten years have seen a sharp rise in the use of medicinal plants in the majority of developed nations; Ayurvedic (herbal) goods have become increasingly popular, an industry in which India has millennia of experience. However, the country has not only witnessed the commercialization of the herbal notion in the previous ten years.

Industry estimates, the whole pharmaceutical market at approximately Rs. 5,000 crore; the herbal market share is estimated at Rs. 1,200 crore, of which the over-the-counter (OTC) segment accounts for approximately Rs. 400 crore.

The herbal drug market itself is growing at a rate of between 20% and 30% annually, with individual company registering different growth rates. The healthy growth rate of this market can also be attributed to the government policy of encouraging the manufacturers of purely herbal products.

This coupled with absence of any pricing guidelines. Unlike 'Drug Price Control Order (DPCO), pricing guidelines for ethical drugs has resulted in this segment being perceived as a highly lucrative alternative source of revenue. The new patent policy under 'GATT', which came into effective by the year 2005, has encouraged the herbal market.

8.4 EXPORT POTENTIAL OF INDIA IN MEDICINAL AND AROMATIC PRODUCTS

From east to west and from north to south, India boasts vast biodiversity and is home to numerous species that are extinct in other countries. Higher flowering plants, or trees, account for 33% of all medicinal plants in India. Herbs come in second at 32%, followed by shrubs at 20%, climbers at 12%, and other plants at 3%. The North-eastern States and the Western Ghats are its two global terrestrial biodiversity hot areas. The new patent policy under 'GATT', which came into effective by the year 2005, has encouraged the herbal market.

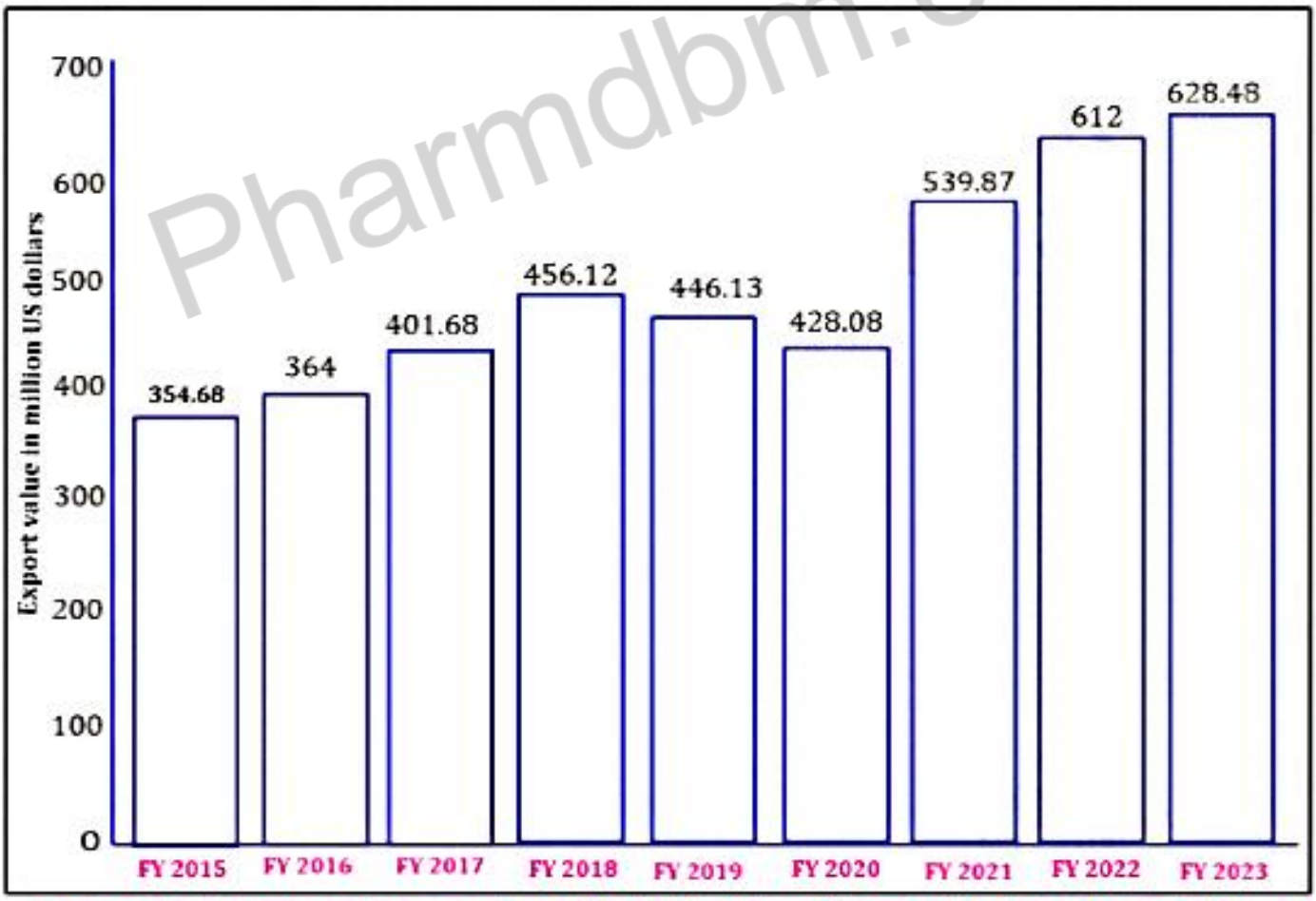

Fig 8.4: Export value of ayurvedic and herbal products from India from financial year 2015 to 2023

While the domestic market (about US$ 1 billion of Ayurvedic medicine) is opening up to the herbal phenomenon; the export market is also showing promise. Many pharmaceutical companies are targeting export as the prime source in the coming years. World trade in plant medicines is of billions of dollar. In 1994, China exported US$ 5 billion of plant drugs; Germany imported about US$ 105 millions of plant drugs. The number of medicinal plants trade too is astonishing. Now Germany export market is about Rs. 600 crore, and is expected to expand to Rs. 20,000 crore in the next decade.

The export of herbs and value-added extracts of medicinal herbs are gradually increasing over the years. India exported USD 330.18 Million worth of Herbs during 2017-18 with a growth rate of 14.22% over the previous year. Also, the export of value-added extracts of medicinal herbs / herbal products during 2017-18 stood at USD 456.12 Million recording a growth rate of 12.23% over the previous year.

India has a significant export potential in medicinal products, particularly in the production of various herbal medicines and pharmaceutical ingredients. Some of the key products with export potential include:

- **Artemisinin:** India is one of the major producers of artemisinin, which is used for treating malaria including cerebral malaria. The country can leverage its expertise and resources to meet global demand for this antimalarial drug.
- **Colchicine:** Derived from various species like *Colchicum luteum* and *Gloriosa superba* among others; colchicine has significant therapeutic value in relieving gout symptoms and treating rheumatic problems.
- **Diosgenin, Hecogenin, Solasodine:** These steroidal sapogenins obtained from *Dioscorea* species are used in hormonal preparations including birth control pills.
- **Ephedrine:** India could tap into its indigenous ephedra plants to produce protoalkaloid ephedrine that finds application as relief medication for asthma or hay fever sufferers globally.
- **Hyoscine (Hyoscyamine):** Natural tropane alkaloids derived mainly from *Datura stramonium* plants find use as sedatives before anesthesia induction during surgery or dilating pupils during ophthalmic procedures.

- **Morphine/Codeine/Papaverine:** Opium-derived alkaloids used as painkiller (Morphine) and antitussive(codeine).
- **Quinine and Quinidine:** Cinchona bark alkaloids, quinine and quinidine, with antimalarial properties have a significant global market demand for the treatment of malaria.
- **Reserpine/Ajmalicine:** Indole-induced Alkaloid from *Rauwolfia serpentina* helps treat high blood pressure (Hypertension) / work as Vasodilator.
- **Sennosides A and B:** Cassia senna derived anthraquinone glycoside helps to relieve habitual constipation/habitual bowel movement regularizer.
- **Taxol (Paclitaxel):** Taxus species-majorly *Taxus brevifolia* derived diterpene ester taxol finds intensive usage in anticancer therapies globally due to its anti-carcinogenic benefits.

Some of the key products with export potential include:

- **Palmarosa oil:** Known for its rose-like fragrance, it is used in skincare products for its moisturizing and anti-aging properties.
- **Mint oil:** With its refreshing scent, mint oil is popularly used in oral care products like toothpaste and mouthwash for fresh breath.
- **Lemon grass oil:** This citrusy-scented oil is commonly used as a natural insect repellent as well as flavoring agent in food and beverages.
- **Eucalyptus oil:** Its strong aroma makes eucalyptus an effective ingredient in cold remedies such as cough drops or chest rubs to relieve congestion.
- **Cedar wood oil:** Used widely for its distinct woody fragrance, cedar wood has applications ranging from perfumes to household cleaners due to its calming effect on the mind.
- **Lavender Oil:** Lavender's soothing scent makes it ideal use during massage, calm ingestion-relaxation product etc.
- **Davana Oil:** Davana Flower Essential Oil widely Used for Sanitation purpose during covid, but also It add sweet Tobacco note people love & hence loved by perfume companies
- **Clove Oil:** clove oil Have Unique Health Benefits including teeth pain relief including known germicidal property which make some unique properties & therefore each essential producing country want more of this.