



Review Article

A REVIEW ON TRADE OF HERBS (SPICE) ON THE LAND OF HINDUSTAN (INDIA)

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ABSTRACT

Traditionally medicine obtain from plants are widely used by the society. Globally a drastic exploration has been seen in regards of Ayurvedic system of medical in last decade. The consumption of medicinal plant is raise, so there is requirement to increase the cultivation, import and export of herbs worldwide for the procurement of the disease. There are lots of challenges and opportunities for cultivation of medicinal plants to get the goal. In present article focused on the Prohibited Plant Material from different countries with his justification, a comparative study on production and export of herbs at interstate. Export of spices from India to different countries. In order to continue total fourteen medicinal plant species are prohibited to import from different countries. Chilli and turmeric are the two herbs whose productivity and export hold the leading position till 2016. Gujarat is one of the growing stage in which the production of herbs is increase from 2012 to 2016. Largest quantity of herbs is exported to Vietnam, U.S.A. and Indonesia.

Key Words: Chilli, Turmeric, Gujarat, Vietnam, U.S.A. and Indonesia.

INTRODUCTION

Traditional preparations made up of medicinal plants, organic matter, etc. Herbal drugs constitute mainly those traditional medicines which primarily use medicinal plant preparations for therapy¹. Traditionally herbal medicines and herbal preparations have been widely used. From the thousands of years in developed and developing countries yet to be paid to its natural origin and lesser side effects incomparative to the synthetic drugs². Availability of several thousands of medicinal plants in the different climatic zones India is known as the “Emporium of Medicinal plants”³. In modern medicine and in traditional systems of medicine medicinal plants continue to provide precious therapeutic agents. Because of economic, little side effects, the concentration is being focused on the examination of efficacy of plant based drugs used in the traditional medicine⁴.

A significant role plays by herbs which providing prime health benefit services for rural people. Herbs also comprise an important natural wealth of a country. Medicinal plant provides therapeutic agents as well as raw materials for the manufacture of traditional and modern medicine. Medicinal plants play an important role in national economy of our country.

Since last decade there has been a rapid addition of the Ayurvedic system of medical treatment in the country. Due to this the role of plants is increase in our life. Positive efforts have been made to cultivate the plants. Lots of research organization has undertaken the studies based on the cultivation practices of medicinal plants, which were found fit and remunerative for marketable cultivation⁵. Thorough knowledge of traditional herbal medicine, Indian stand on gold mine, and lack of interest India has not been able to make the most in the market like china. This position can be achieved by gaining the things like well documented traditional use, medicinal plant free from

pesticide, heavy metals, safety and stability of drug and scientifically generated data boost up the herbal medicine global market Step by step the utilization of herbal drugs is growing and set up a global market for India. In the year 2000 twenty thousand medicinal plant species more than five hundred traditional communities and eight hundred plant species recorded for curing different diseases⁶. Medicinal plant based industry is a promising sector and enormous economic growth potential because of its role in food supplements for care or nutraceuticals⁷. India has rich natural resources due to its weather and climatic conditions prevalent and regional topography. India herbal market constitutes of more than 8000 species. Approximate 50 percent of spices obtain from flowering part are from India. From the last decade now the medicinal science is changed from the ancient Indian science. Lots of pharmaceutical industry has long history to use herbal remedies including digitalis, opium, and quinine. Presently the chronic disease such as cancer, hepatic, skin disease, heart disease, impotency and paralysis are treated with herbal medicine. As per the world health organization near about eighty percent world population depends on plant, mineral, animal origin drugs⁸.

Global bazaar for herbal products

Demand of medicinal plant is increasing day by day so the World Health Organization has projected to increase in global herbs market. Presently the global herbs market is sixty two billion dollar and it will be five trillion dollar up to 2050. India and china has play the major role to provide herbal medicine up to seventy percent of the global diversity. The share of India in global market is twenty percent and china is thirteen percent. Global herbal market includes Australia, Argentina, Brazil, Canada, Indonesia, Japan, Mexico, Singapore and USA. In International market herbal plant is divided into medicinal and aromatic plants, cosmetics, plant materials, plant material

extracts and spices. In European continent, Japan and USA used the medicinal plant as dietary supplement⁹.

Problem and challenges for the cultivation of medicinal plants

There are lots of challenges and opportunities for cultivation of medicinal plants. In that the big challenges are lack of knowledge and deprived agricultural practice, ineffective processing techniques, low quality control procedures, require regulatory mechanism in trade of medicinal plants, rough accessibility and conflicting quality of raw material, Short of assumed accessibility for exports (quality, quantity and price). Standardization in products processes and services not perfectly, short information about the total world trade, demand dynamics in the overseas market. Traditional medicines can be used to maintain, and promote the human health, prevention as well as to reduce symptom and has made great contribution to health. In lots of state government giving the tax rebate for opening the new industry and the product manufacture in these industry are sold out of all over the world. People can export the premium quality of herbal extracts to the Pharmaceutical industry and bulk customers in the global market to increase value benefit. Correct marketing policy should be developed to approach the Indian medicine system⁹.

Prohibited plant material from different countries

Different spices of plant from different countries are prohibited for import in India due to the occurrence of critical pest. Here the fourteen different species and subspecies are explain with his justification¹⁰

Plant species/variety: Banana, Plantain and Abaca

Part Used: Suckers/Rhizomes

Prohibited from the countries: Hawaii, Central & South America, Cameroon and Philippines

Reason: Occurrence of critical pests like

- Moko wilt (*Burkholderia solanacearum*)
- Cameroon marbling (Phytoplasmas)

Plant species/variety: Cassava or tapioca (*Manihot esculenta*)

Part Used: Seed/Stem cuttings

Prohibited from the countries: Africa & South America

Reason: Occurrence of critical pests like

- Cassava bacterial blight (*Xanthomonas campestris* pv. *manihotis*)
- Cassava witches' broom (Phytoplasma)
- Super elongation (*Sphaceloma manihoticola*)

Plant species/variety: Cocoa (*Theobroma cacao*) and plants species belong to Sterculiaceae, Bombacaceae and Tiliaceae.

Part Used: Fresh beans/Pods/Bud wood/ Grafts Root stock/Saplings

Prohibited from the countries: Tropical America, Sri Lanka, West Africa,

Reason: Occurrence of critical pests like

- Black pod of cocoa (*Phytophthora megakarya*)
- Virus strains of Cocoa moth (*Acorocercops cramerella*)
- Cocoa capsid (*Sahlbergiella theobroma*)
- Cocoa beetle (*Steirastoma brevis*)
- Chestnut downy mildew (*Phytophthora katsurae*)
- Mealy pod (*Trachysphaera fructigena*)
- Mirids (*Sahlbergia singularis* & *Distantiella theobroma*)
- Seedling damping-off (*Phytophthora cactorum*)
- Witches' broom (*Crinipellis marasmiius*)
- Watery pod rot (*Monilia (Moniliophthora) roleri*)

Plant species/variety: Cocoyam or Dasheen or Taro (*Colocasia esculenta*) and other edible aeroids

Part Used: Plants/Corms/Cormlets/Suckers

Prohibited from the countries: Cook Islands, Papua New Guinea, Solomon Islands and South Pacific countries

Reason: Occurrence of critical pests like

- Alomae land Bobone (Rhabdo viruses)
- Dasheen mosaic virus (South pacific strains)
- Bacterial blight (*Xanthomonas campestris*)

Plant species/variety: Coconut (*Cocos nucifera*) and related species of Cocoideae

Part Used: Seed nuts/Seedlings/Pollen/Tissue cultures etc.

Prohibited from the countries: Africa, Central America, Caribbean, Philippines, Gaum Brazil, Trinidad, Tobago, Grenada, St. Vincent, Barbados, Belize, Honduras, Costa Rica, Columbia, Dutch Guyana, and Sri Lanka.

Reason: Occurrence of critical pests like

- Lethal boll rot (*Marasmiellus cocophilus*)
- Leaf minor (*Promecotheca cumingi*)
- Palm kernel borer (*Pachymerus spp*)
- Palm lethal yellowing (phytoplasma)
- Red ring (*Rhadinaphelenchus cocophilus*)
- South American Palm weevil (*Rhyncophorus palmarum*)

Plant species/variety: Coffee (*Coffea spp.*) and related species of Rubiaceae viruses), Coffee berry borer

Part Used: Beans (seeds) / Berries (freshly harvested)/ Grafts/ Bud wood/Seedlings/ Rooted cuttings etc.

Prohibited from the countries: Africa and South America

Reason: Occurrence of critical pests like

- American leaf spot (*Mycena citricolor*, syn. *Omphalia flavida*)
- Coffee berry disease (*Colletotrichum coffeanum*)
- Powdery rust (*Hemeleia coffeicola*),
- Phloem necrosis (*Phytomonas leptovosorum*)
- Tracheomycosis (*Gibberella xylariodes*, syn *Fusarium xylarioids*)

Plant species/variety: Date palm (*Phoenix dactylifera*)

Part Used: Seeds/ Off-shoots (suckers)

Prohibited from the countries: Algeria and Morocco USA (Florida)

Reason: Occurrence of critical pests like

- Bayood (*Fusarium oysporum*)
- Palm lethal

Plant species/variety: Oil palm (*Elaeis guineensis*) and related species

Part Used: Seeds/Pollen/ seed sprouts

Prohibited from the countries: Philippines and Guam

Reason: Due to incidence of

- Cadang cadang
- Tinangaja (viroid)

Plant species/variety: Potato (*Solanum tuberosum*) and other tuber bearing species of Solanaceae

Part Used: Tubers and other planting material

Prohibited from the countries: South America

Reason: Occurrence of critical pests like

- Andean potato weevil (*Premnotrypes spp.*)
- Potato smut (*Thecaphora (Angiosorus) solani*),
- Potato virus's viz. Andean potato latent, Andean potato mottle
- Potato deforming mosaic
- Potato T (Capillo virus)

- Potato calico strain of Tobacco ring spot virus

Plant species/variety: Rubber (*Hevea spp.*)

Part Used: Rubber seeds/plants/ bud wood and any other plant material

Prohibited from the countries: Tropical America, Mexico,

Reason: Occurrence of critical pests like

- South American Leaf Blight of Rubber (*Microcyclus ulei*)

Plant species/variety: Sugarcane (*Saccharum spp.*)

Part Used: Cuttings or sets of planting

Prohibited from the countries: New Guinea, Australia, Philippines and Indonesia

Reason: Due to incidence of destructive

- Fiji virus

Plant species/variety: Sweet potato (*Ipomoea spp.*)

Part Used: Stem (Vine) cuttings rooted or un-rooted/tubers

Prohibited from the countries: South Africa, East Africa, New Zealand, Nigeria, USA, Argentina and Israel.

Reason: Occurrence of critical pests like s

- Bacteria wilt (*Pseudomonas batatae*)
- Foot rot (*Plenodomus destruens*)
- Scab (*Elsinoe batatas*)
- Scurf (*Moniliochaetes infuscans*)
- Soil rot (*Streptomyces ipomoeae*)
- Sweet potato witches' broom (Phytoplasmas)
- Seed bruchid (*Mimosestes mimosae*).

Plant species/variety: Yam (*Dioscorea spp.*)

Part Used: Tubers for planting or propagation

Prohibited from the countries: West Africa and Caribbean region

Reason: Due to incidence of destructive Yam

- Mosaic virus/ green banding virus.

Forest plant species

Plant species/variety: Chestnut (*Castanea spp.*)

Part Used: Seeds/ Fruits/ Grafts and other planting material

Prohibited from the countries: North America (USA and Canada)

Reason: Occurrence of critical pests like

- Chestnut blight or canker (*Cryphonectria (Endothia) parasitica*)

Plant species/variety: Elm (*Ulmus spp.*)

Part Used: Plants/ planting material

Prohibited from the countries: North America (USA and Canada) and Europe and Russia

Reason: Occurrence of critical pests like

- Elm phloem necrosis (Phytoplasmas)
- White - banded elm leaf hopper (*Scaphoidous luteolus*)

Plant species/variety: Oak (*Quercus spp.*)

Part Used: Seeds/ Root grafts

Prohibited from the countries: United States of America

Reason: Due to incidence of destructive

- Oak wilt (*Ceratocystis fagacearum*)
- Oak bark beetles (*Pseudopityophthorus spp.*)

Plant species/variety: Pine (*Pinus spp.*) and other coniferous species

Part Used: Seeds/ Saplings

Prohibited from the countries: North America (Canada, USA and Mexico)

Reason: Occurrence of critical pests like

- Brown spot needle blight (*Mycosphaerella dearnesii*, syn. *Scirrhia acicola*)
- Comandra blister rust (*C. comandrae*)
- Stalactiform blister rust (*Cronartium coleosporioides*)
- Sweet fern blister rust (*C. comptoniae*)
- Southern fusiform rust (*C. fusiforme*)
- Needle cast (*Lophodermium spp.*)
- Western gall rust (*Endocronartium harknessii*)

Part Used: Wood with bark

Prohibited from the countries: North America (Canada & USA), Asia (China, Hong Kong, Japan, Korea, Republic of Taiwan)

Reason: Due to destructive

- Pine wood nematode (*Bursaphelenchus xylophilus*)

Production of herbs (spice) in India

Leafy and fruits spices are known as herbs. India produces a wide range of herbs and holds a top position in word spice production. This achievement achieved by varying climatic zone in India. Approximately fifty two spices are brought under the purview of spice board and one hundred nine notified in the ISO list.

Here we emphasized on the production and export of herbs statics. Preliminary analysis perform on the data, available on Spice Board India. Ministry of Commerce & Industry, Govt. of India.

Table 1: List of Herbs (Spice in tones) production in India in different years

Spices	2011-12	2012-13	2013-14	2014-15	2015-16
Chilli	1448215	1378400	1376400	1621480	1628100
Turmeric	1398862	86690	1092630	846250	843530
Ginger	924417	669350	683160	795820	799860
Garlic	898438	1260210	1221380	1424860	1431540
Cumin	462645	394330	445030	372290	372290
Coriander	428687	503240	496240	546800	557000
Tamarind	182089	189980	191750	200390	202510
Fennel	144112	142940	135930	78570	78570
Fenugreek	121775	112870	110530	134100	134100
Pepper	43000	65000	37000	70000	48500
Ajwan	28050	26620	26610	17180	17180
Cardamom(Small)	15000	14000	16000	18000	22000
Celery	5271	5510	5510	5510	5510
Cardamom(Large)	3860	4145	4465	4850	5300
Clove	1035	1060	1060	1260	1200

Table 2: State wise production of Herbs (spice in tone)

State	2011-12	2012-13	2013-14	2014-15	2015-16
Andhra Pradesh	1370759	1246693	775820	918018	920809
Telungghana	-	-	551470	493930	493930
Gujarat	882141	882141	848480	1014470	1014470
Rajasthan	950876	860889	674832	618309	618309
Karnataka	423333	370070	333822.3	400297	395963
Tamil Nadu	466448	279674	554509	196127	212500
Uttar Pradesh	227031	212305	244022	221711	221711
West Bengal	214665	207662	207720	207775	207775
Orissa	530170	181500	181500	181500	181500
Kerala	135041	119689	114049	130413	-
Maharashtra	357821	109040	109040	130094	130094

Table 3: List of Herbs (Spice in tones) export from India in different years

Year	2011-12	2012-13	2013-14	2014-15	2015-16
Chili	241,000	301,000	312,500	347,000	347,500
Turmeric	79,500	88,513	77,500	86,000	88,500
Cumin	45,500	85,602	121,500	155,500	98,700
Coriander	28,100	35,902	45,750	46,000	40,100
Pepper	26,700	15,363	21,250	21,450	28,100
Fenugreek	21,800	29,622	35,575	23,100	33,300
Ginger	21,550	22,207	23,300	40,400	24,800
Amarind	21,395	17,950	16,000	13,500	15,350
Curry powder/paste	17,000	17,436	23,750	24,650	26,550
Mint products (3)	14,750	20,039	24,500	25,750	21,150
Fennel	8,100	13,811	17,300	11,650	15,320
Spice oils & oleoresins	7,265	9,515	11,415	11,475	11,635
Cardamom(s)	4,650	2,372	3,600	3,795	5,500
Celery	3,650	5,171	5,600	5,650	5,800
Nutmeg & mace	3,620	3,231	4,450	4,475	4,050
Garlic	2,200	22,872	25,650	21,610	22,500
Cardamom(l)	935	1,217	1,110	665	600

Table 4: Country wise export of Herbs (spice in tone)

Country	2012-13	2013-14	2014-15	2015-16
Vietnam	60908	84214	107452	107452
U.S.A	71087	71038	80919	80919
Indonesia	22237	73267	71187	71187
U.A.E	57238	58932	68193	68193
Malaysia	64947	62796	62555	62555
Sri lanka	48528	58428	60112	60112
Saudi arabia	22351	25812	26177	26177
U.K	22101	23249	25324	25324
China	25751	21571	20635	20635
Mexico	15383	12602	15256	15256
Spain	11031	12756	14209	14209
Singapore	7927	8362	10477	10477
Germany	7125	8148	9529	9529
Japan	6628	6754	8198	8198
Netherlands	6586	7778	7766	7766

Table 5: Major Herbs (Spices) export from India to different country

Pepper	Cardamom (small)	Cardamom (large)	Chilli	Ginger	Turmeric	Coriander	Cumin
Australia	Canada	Pakistan	Bangladesh	Bangladesh	Bangladesh	Malaysia	Brazil
Canada	Japan	U.S.A	Indonesia	Germany	Germany	Pakistan	Egypt
France	Kuwait		Malaysia	Nepal	Iran	Saudi Arabia	Malaysia
Germany	Saudi Arabia		Mexico	Pakistan	Japan	Singapore	Pakistan
Italy	U.A.E		Nepal	Saudi Arabia	Malaysia	South Africa	Saudi Arabia
Japan			Pakistan	Spain	Morocco	Sri Lanka	Spain
Netherlands			Saudi Arabia	U.A.E	Netherlands	U.A.E	U.A.E
Poland			Singapore	U.K	Saudi Arabia	U.K	U.K
Russia			South Africa	U.S.A	South Africa	U.S.A	U.S.A
South Africa			Sri Lanka	Y.A.R	Spain	Y.A.R	Vietnam
Sweden			Thailand		Sri Lanka		
Taiwan			U.A.E		Tunisia		
U.K			U.K		U.A.E		
U.S.A			U.S.A		U.K		
Vietnam			Vietnam		U.S.A		

Table 6: Major Herbs (Spices) export from India to different country

Celery	Fennel	Fenugreek	Other Seeds	Nutmeg & Mace	Curry powder /Mixture	Spice oils & Oleoresins	Mint Products
Australia	Canada	Germany	Australia	Argentina	Australia	Brazil	China
Canada	Malaysia	Japan	Canada	Brazil	Canada	Canada	France
China	Morocco	Saudi Arabia	Malaysia	Egypt	Kuwait	China	Germany
Egypt	Saudi Arabia	South Africa	Nepal	Germany	Nigeria	France	Japan
Germany	Singapore	Sri Lanka	Russia	Israel	Oman	Germany	Netherlands
Japan	Sri Lanka	Sudan	Saudi Arabia	Nigeria	Qatar	Hong Kong	Singapore
Netherlands	Tunisia	U.A.E	Singapore	Pakistan	Saudi Arabia	Indonesia	U.K
South Africa	U.A.E	U.K	Sri Lanka	U.A.E	U.A.E	Japan	U.S.A
U.K	U.K	U.S.A	U.A.E	U.S.A	U.K	Korea(south)	
U.S.A	U.S.A	Y.A.R	U.K	Vietnam	U.S.A	Netherlands	
			U.S.A			South Africa	
			Vietnam			Spain	
						Thailand	
						U.K	
						U.S.A	

Table 1 represents the list of major spice that is cultivated in India. Year 2014 to 16 is only advance estimated data by the government so here we focused on 2011 to 14. In the year 2013-14 the production of Chilli, Turmeric, Ginger, Cumin, Fennel, Fenugreek, and Pepper was reduced. In the case of Garlic, Cardamom (Small), Celery, Cardamom (large) and clove markedly increased. A comparative graphical view is representing in fig 1 for understanding the production status of spices. Fig 2 is easily elaborating the advance estimate production of spices in 2015-16.

Table 2 shows that Andhra Pradesh, Rajasthan, Karnatka, Tamil Nadu, West Bangal.Orisa, Kerala and Maharashtra are the major state of India in which the production of spices is decreased day by day. Gujrat and Uttar Pradesh are the two major States where the production of herbs is not decreased but markedly increased. Fig 3 graphically represents the comparative analysis in between the 2014-15 to 2015-16. Fig 4 is elaborating the state wise advance estimate production of spices in 2015-16.

Export of herbs (spice) from India

The export of medicinal plant herbs from the India has been moderately considerable for the last few years. India has a large endemic plant life. There are more than eighty thousand medicinal plants known and nearly one hundred eighty plants are derived chemical compounds have been developed as modern pharmaceuticals which are include in the modern

pharmacopoeia of India. The major export of herbs and spices from the India is listed below.

Table 3 represent the list of major herbs export from India to different countries. Analysis of table shows that export of herbs increase in the case of Chili, Turmeric, Cumin, Coriander, Fenugreek, Ginger, Curry Powder, Mint Product, Fennel, and Spice Oil. A Drastic increment of export in was found to be in the case of Garlic and Spice Oil from 2012 to 2015. Markedly increment was found to be in case of Cardamom(S), Celery and Cardamom (L). Figure 5 represents the comparative view of herbs export from India 2013 to 2015. The result shows that total export of herbs is increased in 2015 since last few years. Fig 6 easily explains the export herbs in the year 2015. In 2015 Chili is one of the major exporter herbs since last few years.

Table 4 Represent the exports of herbs from India to major group of countries. Data analysis based on the provisional and estimated amount of herbs as calculated by government of India. Leading position is hold by Vietnam from 2012-16. U.S.A is the second importer of the herbs from India. Demand of the Indonesia for consumption of the herbs is increase since few years. Malaysia and China are the two countries in that the export of is constant from 2012. U.A.E Sri Lanka Saudi Arabia, U.K, Spain, Germany, Japan and Netherland markedly increase the export of drugs from India. An estimated amount of export of herbs from 2014 to 2016 graphically represent in the figure 7. Figure 7 shows that there is no more difference for estimated

export of herbs. In 2014 to 2016 Vietnam captured the top position and Netherland has smallest amount of herbs import from India. Fig 8 represent the data analysis from 2015-16. Fig 8 conclude that in 2015-16 Vietnam, U.S.A, Indonesia, U.A.E, Malaysia and Sri Lanka are the major countries where the India export the maximum amount of herbs when compared to other countries

Export of major herbs (spices) from India

Market of herbs has grown with impassive rate in India. Herbal market is the fast-growing market at global level. Presently developed countries are using the medicinal system who depend on the herbs and natural remedies. So the demand of the herbs has been increase. India is one of those countries who compensate the demand of herbs at global level. In Table 5 and 6 include the list of major herbs export from India to different countries. Pepper, Chilli, Turmeric and spice oils are the herbs which are largely exported from India to more than 14 countries.

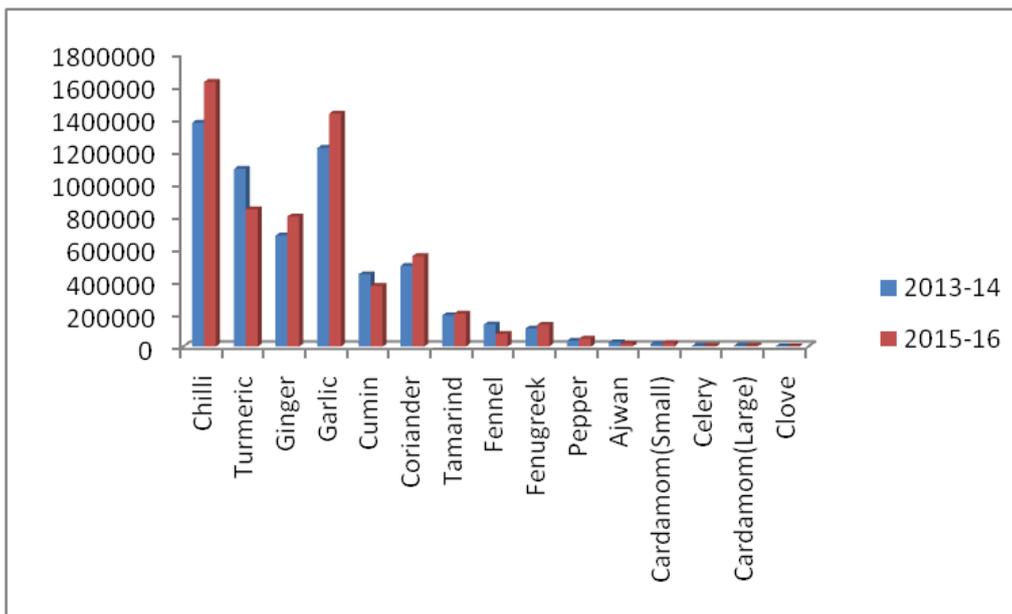


Figure 1: Comparative view of spice production in two different years

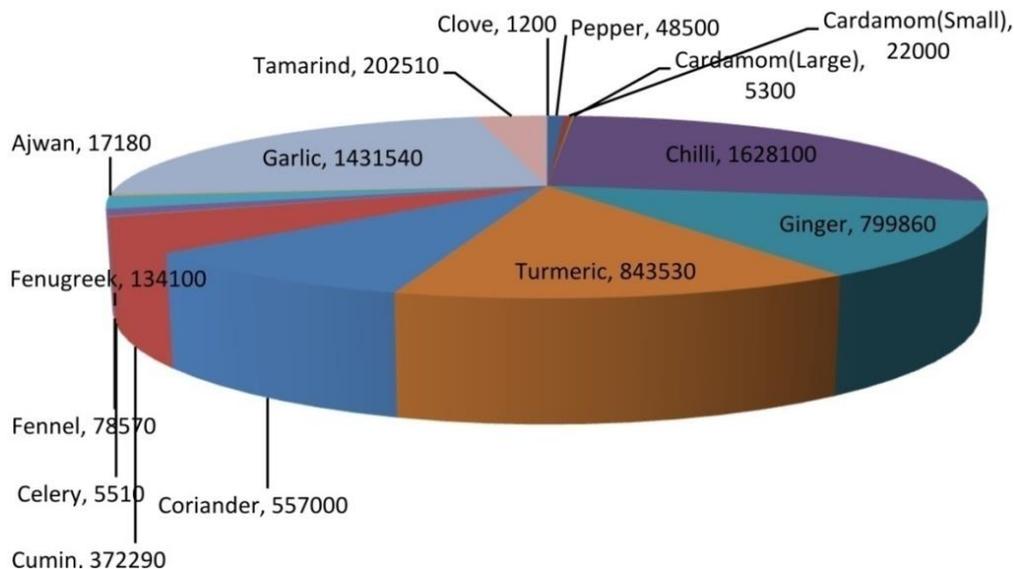


Figure 2: Production of Herbs (spice in tones) in the 2015-16

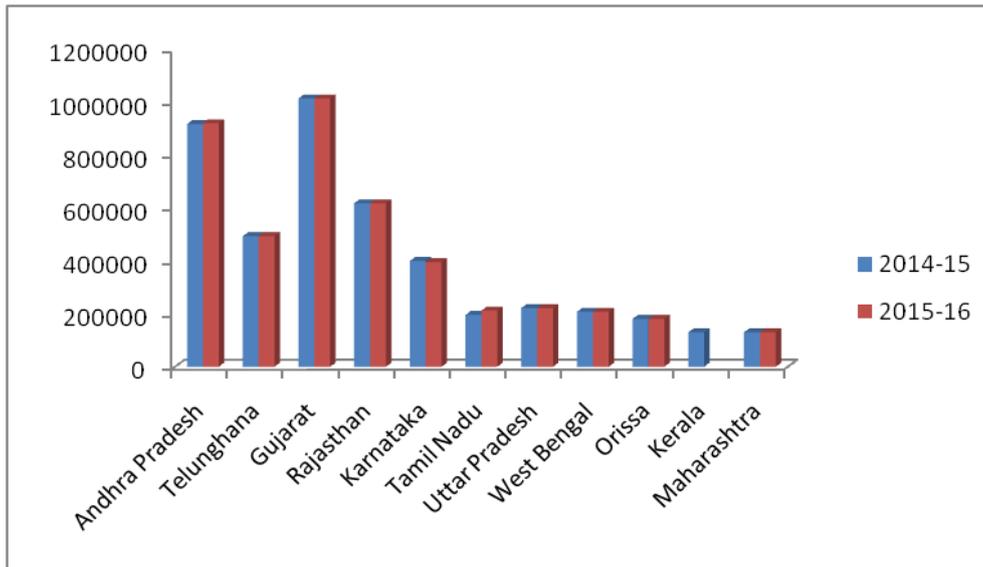


Figure 3: State wise comparative view of spice production in two different years

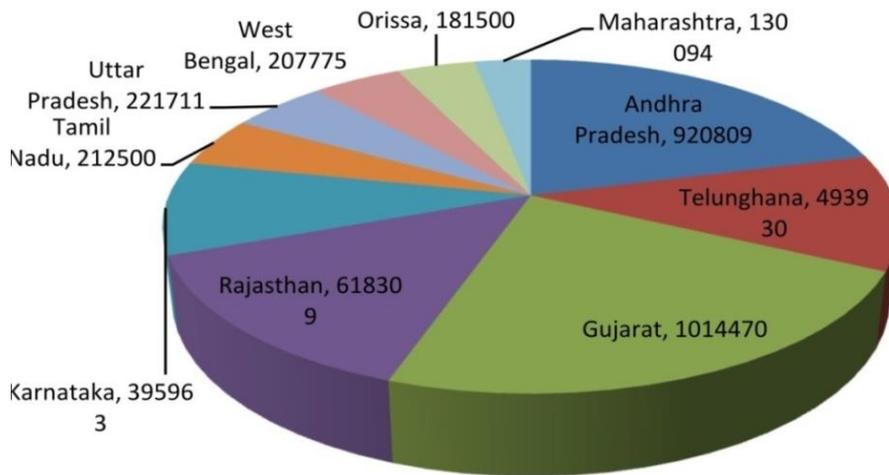


Figure 4: State wise production of Herbs (spice in tones) in the 2015-16

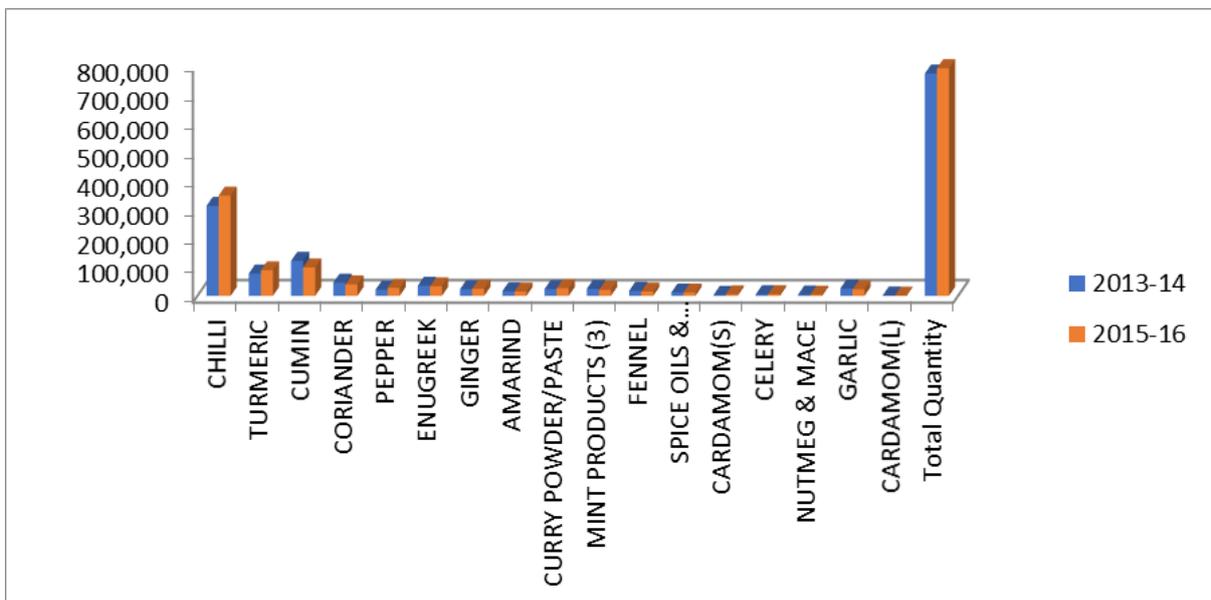


Figure 5: Comparative view of herbs (spice) export in two different years

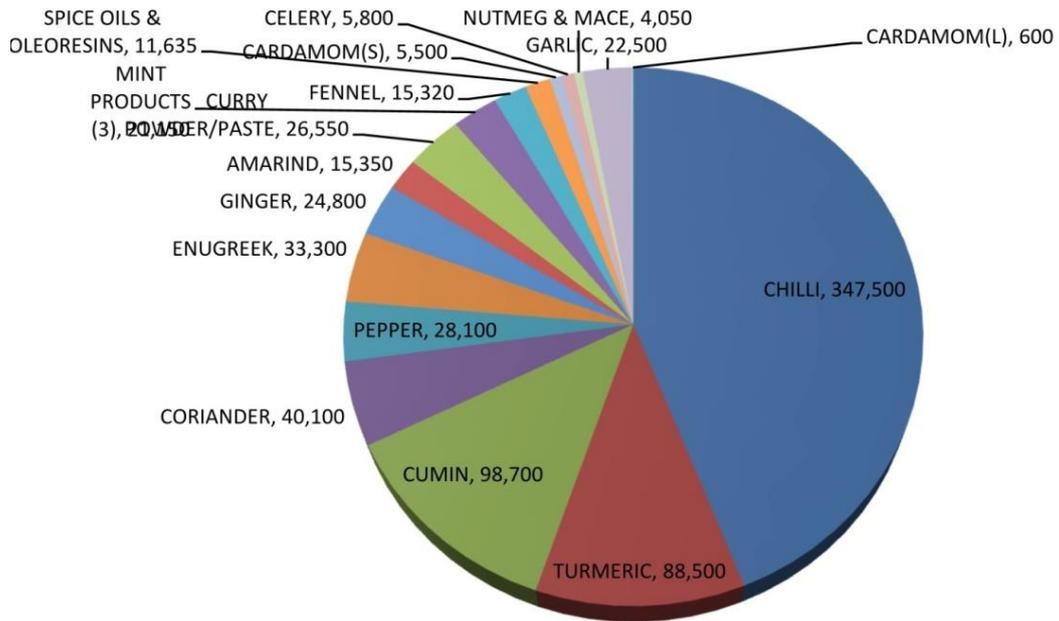


Figure 6: Export of Herbs (spice in tones) in the 2015-16

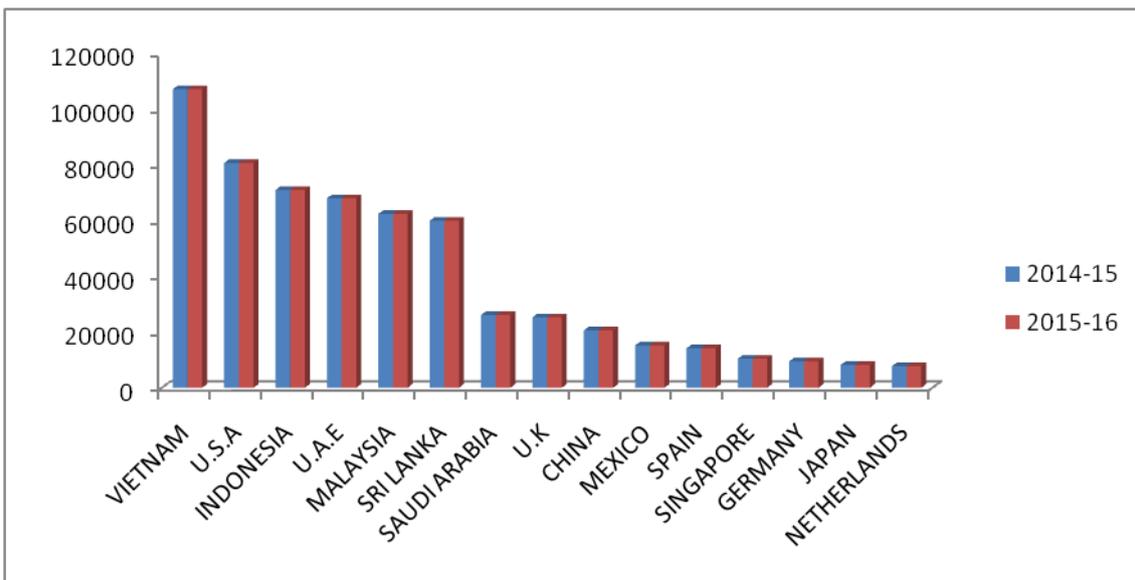


Figure 7: County wise comparative view of herbs export in two different years

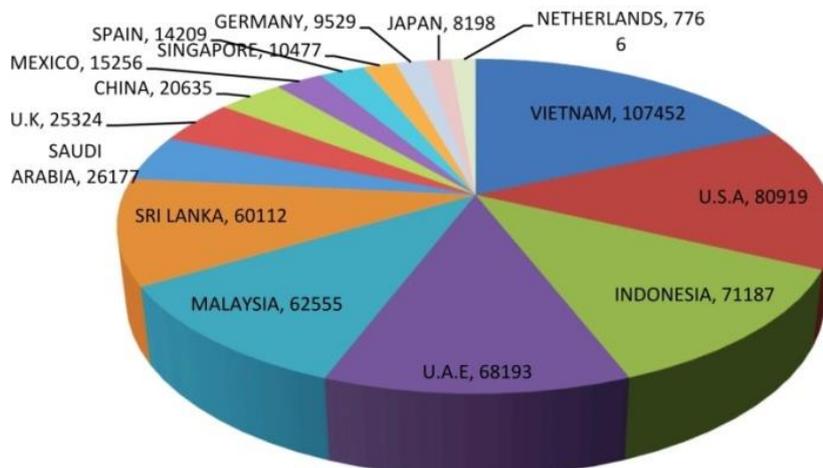


Figure 8: Country wise export of Herbs (in metric tons) in the 2015-16

CONCLUSION

Analysis with the above mentioned data study reveals that the demand of the herbs is increased by some nearby country of the India. But in some cases the export of herbs is decrease, which directly affects the economy of our Country. We think that production is one of the important factors who indirectly affect the export. Various factors are responsible for the above mention fats e.g. illiterate for right production, empathy of funds for conducting R&D to grow a good species of medicinal plants, coldness to export promotion zones for medicinal plants and herbs, lack of knowledge for harvesting, drying and storage of medicinal plant. Government should develop marketing services for increment of herbs export.

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