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Indian Export Scenario of Pepper Oil and Pepper Oleoresin

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Abstract:
India is known as "The Home of Spices". There are over 54 kinds of spices grown across the India. The spices that India offers in abundance are pepper, ginger, turmeric, chilli, cardamom, celery, fenugreek, fennel, cumin, coriander, cinnamon, ajwain (bishop's weed), cassia, clove, nutmeg and mace etc. Interestingly, each of the spice has its own flavour, medicinal value and other interesting facts to go with it. In fact, the very commonly used word 'AROMA' is the ancient Greek word for spice. India dominates the global market for spice oleoresin, which is in big demand from processed food and fragrance industries that now mostly prefer natural colouring and flavouring agents to artificial ones as consumers become increasingly health conscious. India controls 60 per cent of the (13,500 tonne) global spice oleoresins market even as China has emerged as a strong contender in paprika oleoresin, the most in-demand spice oil. India is rated as the highest pepper consuming country in the world. Though demand for pepper exists throughout the year, a surge is noticeable during the winter months. The share of India in global pepper export has declined to less than 10 per cent during last three year. The share of Indian raw pepper export has declined, India is major producer of pepper oil and pepper oleoresin in the world. 90 per cent of global pepper oleoresin is produced in India. The advantages of using oleoresins in flavours and seasonings are manifold. They enhance the visual appeal and flavour, and increase the shelf life of the products the largest oleoresin extraction firm in India. They are more economical than whole or ground spices as less quantity can give the same effect. The study is based on secondary data. The secondary data has been collected from Spices Board and International Pepper Community. And also necessary information will be gathered from various Books, Journals, Seminar Volumes, Food and Agriculture Organization statistics and Reports, Market reviews etc. The data analyzed by adopting Compound Annual Growth Rate analysis. The tables and graphs are generated from the analysis of secondary data were collected from the year 2001 to 2010.

Key words: *India, Pepper oleoresin, Metric tonnes*

1. Introduction

Agriculture in India contributes nearly 13.7 per cent to the gross domestic product (GDP) in 2012-13 due to shift from traditional agrarian economy to industry and service sectors according to the Central Statistical Organization 2012-13. The decrease in the share of Agricultural and Allied Sectors in GDP of the country in comparison to other sectors is on account of structural changes due to a shift from a traditional agrarian economy to industry and service dominated one. This phenomenon is generally expected in the normal development of an economy. Agriculture and allied sectors like forestry, logging and fishing accounted for 17 per cent of the GDP in 2012, employed 51 per cent of the total workforce, and despite a steady decline of its share in the GDP, is still the largest economic sector and a significant piece of the overall socio-economic development of India. Crop yield per unit area of all crops have grown since 1950, due to the special emphasis placed on agriculture in the five-year plans and steady improvements in irrigation, technology, application of modern agricultural practices and provision of agricultural credit and subsidies since the Green Revolution in India. However, international comparisons reveal the average yield in India is generally 30 per cent to 50 per cent of the highest average yield in the world. Indian states Uttar Pradesh, Punjab, Haryana, Madhya Pradesh, Andhra Pradesh, Bihar, West Bengal, Gujarat and Maharashtra are key agricultural contributing states of India. India receives an average annual rainfall of 1,208 millimetres (47.6 inches) and a total annual precipitation of 4000 billion cubic metres, with the total utilisable water resources, including surface and groundwater, amounting to 1123 billion cubic metres. 546,820 square kilometres (211,130 sq miles) of the land area, or about 39 per cent of the total cultivated area, is irrigated. India's inland water resources including rivers, canals, ponds and lakes and marine resources comprising the east and west coasts of the Indian ocean and other gulfs and bays provide employment to nearly six million people in the fisheries sector.

The spices are found in hot and moist parts of Southern India. Kerala alone contributes about 96 per cent of the total production in India during the year 2013, next comes Karnataka with 3.5 per cent. The rest 0.5 per cent is contributed by TamilNadu, Pondicherry and Andaman and Nicobar. Even though pepper is cultivated throughout Kerala, Calicut, Cannanore, Kottayam and Idukki districts accounts for 67 per cent of the total pepper area. In Karnataka, Kodagu, Chikkamagalore, Hassan, North Kanara and Shimoga are major centres of pepper production. Likewise in TamilNadu, Kanyakumari, Nilgiris and Mahe in Pondicherry are the major centers of pepper production, black pepper is also grown in some parts of Orissa. AndraPradesh and the North Eastern region. But now pepper cultivation has spread to some parts of Goa and Maharashtra also.

2. Global Scenario of Pepper

Production of pepper in 2011 was estimated at 298,400 Metric tonnes (229,700 Metric tonnes of black pepper and 68,700 Metric tonnes of white pepper), a decrease of 9 per cent from 329,700 Metric tonnes (257,600 Metric tonnes of black pepper and 72,100 Metric tonnes of white pepper) in 2010 mainly due to substantial decrease of production in Indonesia. Exports of pepper from producing countries was around 252,900 Metric tonnes (213,000 Metric tonnes of black pepper and 39,900 Metric tonnes of white pepper), a decrease of 6 per cent when compared to export of 269,200 Metric tonnes in 2010, mainly due to substantial decrease of exports from Indonesia and Sri Lanka. Production and export of Brazil and Malaysia increased, while in India production decreased but increased in terms of export. Production of pepper in Vietnam was reportedly same as previous year, but increased in terms of export. Substantial decrease in production and export in Indonesia and Sri Lanka was not compensated by increased production in other countries. Production and export of black pepper decreased by 11 per cent and 4 per cent respectively from 257,600 Metric tonnes and 222,300 Metric tonnes respectively in 2010 to 229,700 Metric tonnes and 213,000 Metric tonnes respectively in 2011. Production and export of white pepper also decreased by 5 per cent and 15 per cent respectively.

Production of pepper in India during 2011 decreased by 2,000 Metric tonnes to 48,000 Metric tonnes. Export from India however increased to 23,800 Metric tonnes, including export of ground and green pepper products valued at USD 149 million as against 18,500 Metric tonnes worth USD 75 million in 2010. The export represented an increase of twenty eight per cent in quantity and almost double in value. The increase in export was possible from import of around 14,000 Metric tonnes Based on the details received by the International Pepper Community, exports in 2010 and 2011 was slightly higher when compared to exports figures reported in the November Session of International Pepper Community.

Domestic consumption includes pepper for grinding, extraction of oil and oleoresins, the requirements of other industries, households and food establishments. In 2011, domestic consumption of pepper producing countries is estimated at around 121,000 Metric tonnes, which is marginally lower compared to the consumption during 2010 (122,000 Metric tonnes). The decrease was understandable due to reduction of pepper production in 2011.

- **Pepper oil:** Pepper oil is extracted from the plant Piper nigrum of the Piperaceae family. The oil is made from the unripe red fruit of the plant, while white pepper for household use is made from the same fruit, but the berry is picked when fully ripe and the outside layer (pericarp) is removed before drying.
- **Pepper oleoresin:** Piper nigrum linn or black peppercorns is produced through steam distillation to get the aromatic, odorous constituent of spice i.e., volatile oil whilst the pungent, non volatile principles for which the pepper is so highly esteemed as a condiment is present in its oleoresin, which is obtained by the extraction of berries with volatile solvents and concentrating to remove the solvent. The crushed black pepper generally yields 1 to 2.5 per cent of volatile oil which contains mainly terpenes sesquitenpenes and oxygenated compounds and is used for flavouring and perfumery. The oleoresin of pepper contains alkaloids, piperine (4 - 10 per cent) and chavicine which contributes for its pungent taste.
- **Origin of pepper oil:** The plant originated from India, Malaysia, Madagascar, China and Indonesia and the oil is mostly made in Singapore, India and Malaysia.
- **Pepper and its products:** Oleoresin as a single extract, the Indian extraction procedure developed by Central Food Technological Research Institute made it a two-stage process with the separation of essential oil. Firms such as Synthite further improved it. India's capability to make oleoresins and it was a challenge to get our products accepted as oleoresins were still a novel concept for many spices users. It was perhaps the economic liberalisation in the early nineties that opened up the possibilities for these firms through export-promoting measures such as duty-free import against exports and paved the way for the supremacy of Indian oleoresins. The biggest consumers of oleoresins have been the processed food sector in developed countries, where the purchasing power is high. Its customers include flavour and fragrances makers, seasoning companies, spice blenders, meat processors and organic retail chains in cosmetics and fragrances.
- **Medicinal properties of pepper:** Anthelmintic, carminative, alterant, antiperiodic, diuretic, digestive, emmenagogue, rubefacient, stimulant, stomachic, used in fever, asthma, cough, dyspepsia, flatulence, arthritis, expectorant, thermogenic, diuretic, tonic, purgative, stomachic, digestive, emollient, antiseptic, used in bronchitis, fever, asthma.
- **Uses:** Black pepper oil can be used to help in the treatment of pain relief, rheumatism, chills, flu, colds, increase circulation, exhaustion, muscular aches, physical and emotional coldness, nerve tonic and fevers. It furthermore increases the flow of saliva, stimulates appetite, encourages peristalsis, tones the colon muscles and is a general digestive tonic.

3. Objectives of the Study

- To study the export performance of Indian pepper oil and pepper oleoresin in International market.
- To analyze the export decade trend of pepper oil and pepper oleoresin from India.

4. Methodology

The study is based on secondary data. The secondary data has been collected from Spices Board and International Pepper Community. The data analyzed by adopting Compound Annual Growth Rate analysis. The tables and graphs are generated from the analysis of secondary data were collected from the year 2001 to 2010. And which are engaged in production and marketing of spices in the state in particular and all India level in general. And also necessary information will be gathered from various Books, Journals, Seminar Volumes, Food and Agriculture Organization statistics and Reports, Market review etc.

World	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	CAGR
Brazil	1	1	2	1	2	2	3	3	2	2	**10.46**
Canada	1	3	2	2	6	5	3	1	1	1	**-5.95**
France	4	3	4	4	4	2	9	4	3	3	**-0.51**
Germany	7	10	16	15	12	25	21	21	23	22	**12.37**
Indonesia	1	1	1	1	1	1	2	2	2	2	**10.61**
Italy	2	2	3	2	2	1	2	2	2	2	**-1.64**
Japan	3	2	2	2	2	1	3	3	3	3	**3.32**
Netherlands	1	3	1	1	6	2	5	2	4	3	**12.27**
Russia	1	1	1	1	1	1	1	2	1	2	**6.06**
Spain	1	2	2	2	2	2	3	3	2	3	**8.28**
Switzerland	4	3	4	5	3	2	8	6	2	3	**-1.44**
U.S.A	13	24	23	18	10	23	23	16	19	18	**0.64**
United Kingdom	4	5	5	4	6	4	4	7	5	5	**2.01**
Others	3	1	5	4	8	5	7	6	7	11	**18.09**
Total	**46**	**61**	**71**	**62**	**65**	**76**	**94**	**78**	**76**	**80**	**5.19**

Table 1: Export Of Pepper Oil From India During 2001 To 2010 (Quantity In Metric Tonnes)
Source: International Pepper Community, 2013

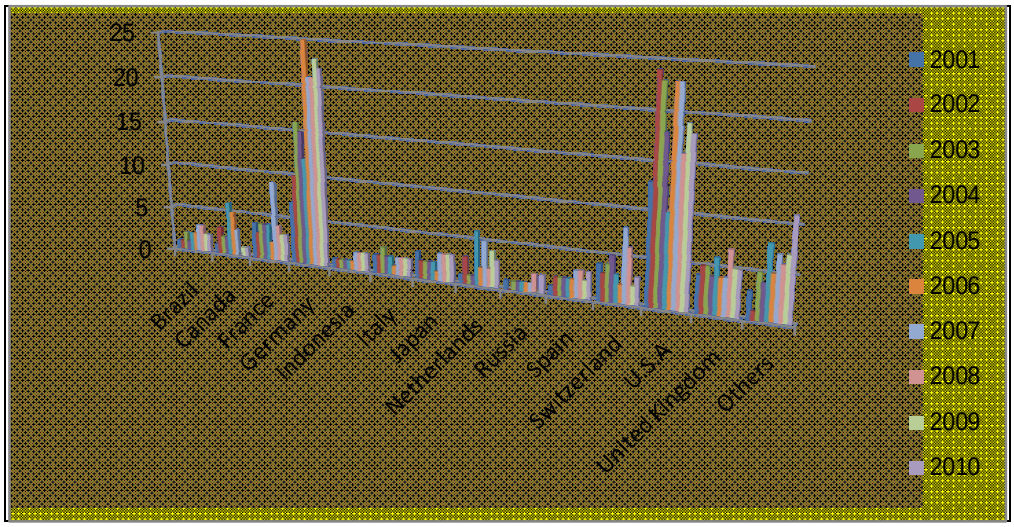

Figure 1: Export of Pepper Oil from India during 2001 to 2010 (Quantity in Metric tonnes)

The table 1 and 1 figure shows the major pepper oil exporting from India. The data 2001 to 2010 about the pepper oil export clearly indicate that Germany is the highest exporting country in the world. During 2001 nearly 7 Metric tonnes were exported, and gradually it has been increased to 22 Metric tonnes in the year 2010. After Germany, the other importing country of pepper oil is Netherland. During 2001 the country exported 1 Metric tonnes of pepper oil, and year by year it has also been increased to 3 Metric tonnes in 2010. The Compound Annual Growth Rate of major pepper oil exporting during 2001 to 2010 has been presented in the same table in percentage. The Germany register with highest Growth Rate with 12.37 per cent, Netherlands 12.27 per cent holds second position followed by Indonesia 10.61 per cent, Brazil 10.46 per cent, and USA accounts with 0.64 per cent. Negative Annual Growth Rate shows very less demand towards pepper oil in overseas such countries like Canada, France, Italy and Switzerland.

World	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	CAGR
Brazil	41	19	43	24	38	47	203	236	150	181	**29.74**
Canada	38	63	30	33	97	99	122	27	114	83	**9.25**
France	198	73	96	85	89	33	451	338	223	304	**14.25**
Germany	284	248	273	277	202	464	605	972	1542	1480	**25.27**
Indonesia	32	17	16	25	22	19	93	121	112	153	**28.36**
Italy	110	58	78	37	38	28	93	143	122	149	**8.48**
Japan	282	77	61	48	57	22	143	229	197	227	**8.57**
Netherlands	48	69	25	22	89	37	215	120	262	228	**25.26**
Russia	22	8	29	15	27	37	64	135	30	192	**28.29**
Spain	32	45	33	44	35	42	134	171	150	215	**25.38**
Switzerland	197	108	87	88	50	49	369	377	152	222	**9.57**
U.S.A	487	515	397	296	173	432	809	812	1299	1353	**15.08**
United Kingdom	154	105	98	70	106	76	177	508	332	382	**17.72**
Others	206	88	186	136	136	170	380	618	692	982	**25.75**
Total	**2131**	**1493**	**1452**	**1200**	**1159**	**1555**	**3858**	**4807**	**5377**	**6151**	**18.70**

Table 2: Export Of Pepper Oil From India During 2001 To 2010 (Value In Usd'000)
Source: International Pepper Community, 2013

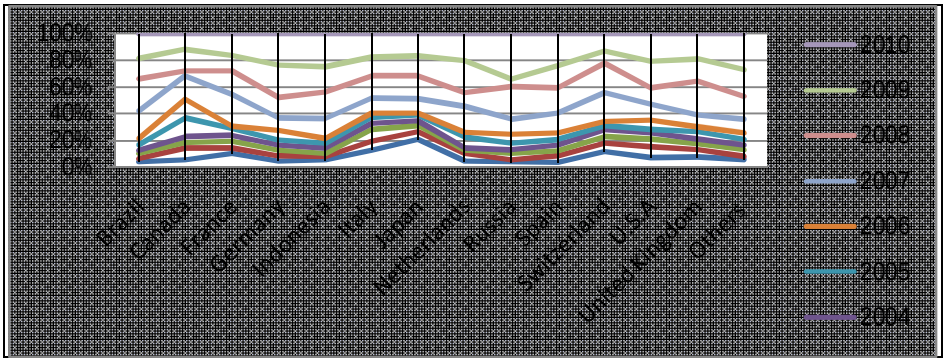

Figure 2: Export of Pepper Oil from India during 2001 to 2010 (Value in USD'000)

The Table 2 and figure 2 shows the India's export value of pepper oil during 2001 to 2010. During 2001, Germany imported the pepper oil worthy 284 US Dollar. The value for the USA was 487 US Dollar during 2001. However it has tremendously increased to 1480 US Dollar during 2010 and USA Imported value 1353 US Dollar It shows that USA is the second largest importer of Indian pepper oil followed by Switzerland, Canada, Japan and Italy.

World	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	CAGR
Australia	14	13	17	15	17	22	4	44	17	28	**5.71**
Austria	6	7	13	11	5	13	19	11	4	35	**8.61**
Brazil	10	8	22	14	24	24	24	27	18	24	**10.31**
Canada	33	36	36	46	41	37	51	48	40	37	**2.09**
France	56	59	43	52	59	80	35	43	27	25	**-7.92**
Germany	111	143	120	149	153	201	199	217	178	168	**5.84**
Korea, Rep. of	9	3	13	17	17	18	15	19	19	22	**14.64**
Netherlands	9	43	28	52	28	39	27	23	35	23	**2.69**
Poland	4	8	13	10	11	11	11	18	18	37	**18.22**
Thailand	4	7	11	11	13	13	16	23	18	33	**20.24**
U.S.A	280	380	353	486	328	501	442	429	286	426	**1.77**
United Kingdom	125	113	89	134	138	86	80	78	83	127	**-2.81**
Others	136	148	181	218	222	228	267	352	276	353	**10.79**
Total	**797**	**968**	**939**	**1215**	**1056**	**1273**	**1190**	**1332**	**1019**	**1338**	**4.27**

Table 3: Export of Pepper Oleoresin from India during 2001 to 2010 (Quantity in Metric tonnes)
Source: International Pepper Community, 2013

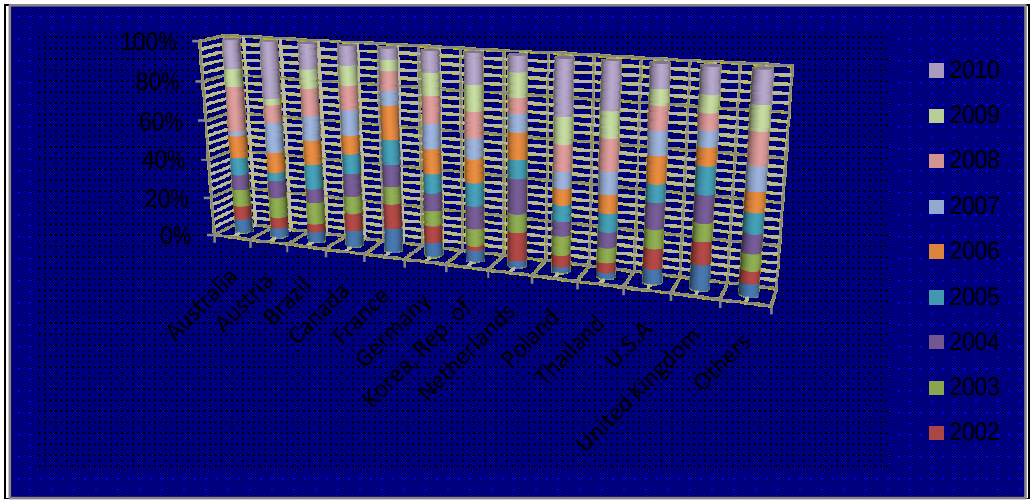

Figure 3: Export of Pepper Oleoresin from India during 2001 to 2010 (Quantity in Metric tonnes)

The table 3 and 3 figure indicates the major pepper oleoresin exporting from India. The data 2001 to 2010 about the pepper oleoresin export clearly indicate that USA is the highest importing country in the world. During 2001 nearly 280 Metric tonnes were exported, and gradually it has been increased to 426 Metric tonnes in the year 2010. After USA, the other pepper oleoresin importing country is Germany. During 2001 the country exported 111 Metric tonnes of pepper oil, and year by year it has also been increased to 168 Metric tonnes in 2010. The Compound Annual Growth Rate in export of major pepper oleoresin exporting countries during 2001 to 2010 has been Clearly shows that the highest Growth rate has been register in Thailand with highest growth rate with 20.24 per cent, Poland 18.22 per cent it accounts second place followed by, Korea 14.64 per cent, Brazil 10.31 per cent and United Kingdom and France accounts negative Annual Growth Rate -2.81, -7.92 per cent respectively, it shows demand towards pepper oleoresin is decreasing in this countries.

World	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**CAGR**
Australia	214	176	202	181	216	318	102	1284	418	635	**15.49**
Austria	122	92	144	157	55	195	439	314	85	659	**14.87**
Brazil	163	148	321	202	345	345	577	830	513	696	**19.70**
Canada	546	513	433	557	487	434	1117	1247	980	800	**9.67**
France	926	786	545	635	681	1190	868	1188	578	523	**-1.15**
Germany	1804	1883	1435	1905	1955	2707	3869	5514	4196	3731	**13.80**
Korea, Rep. of	200	43	181	262	262	285	340	523	476	534	**21.28**
Netherlands	150	566	341	620	321	484	613	648	807	564	**11.52**
Poland	63	99	168	125	117	124	236	523	355	756	**26.62**
Russia	69	68	150	144	174	263	554	661	638	1294	**38.65**
Thailand	76	103	128	141	163	179	386	655	507	864	**30.81**
U.S.A	4170	4297	4047	5577	3701	6219	8524	9181	6811	9567	**10.57**
United Kingdom	1775	1429	1114	1213	1196	881	1530	1451	1411	1788	**1.03**
Others	2516	2206	3465	3904	2678	3699	5656	10168	5997	7149	**15.11**
Total	**12794**	**12409**	**12674**	**15623**	**12351**	**17323**	**24811**	**34187**	**23772**	**29560**	**12.05**

Table 4: Export Of Pepper Oleoresin From India During 2001 To 2010 (Value In Usd'000)
Source: International Pepper Community, 2013

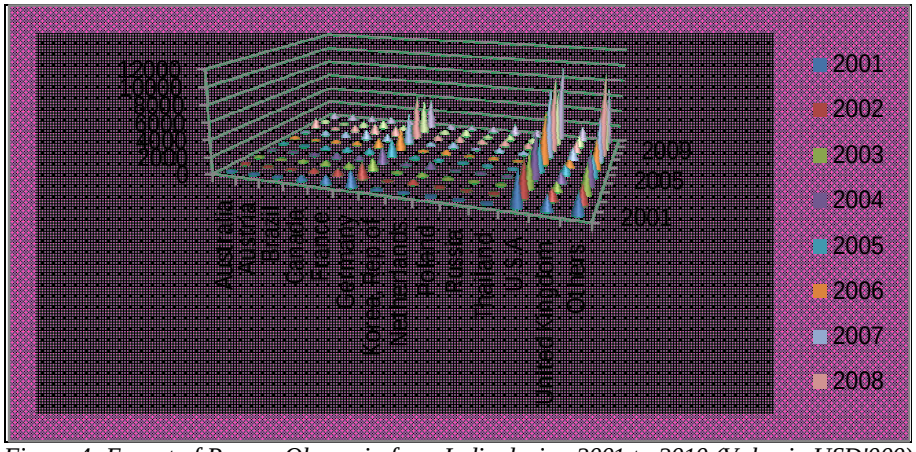

Figure 4: Export of Pepper Oleoresin from India during 2001 to 2010 (Value in USD'000)

Table 4 and figure 4 reveals the India's export value of pepper oleoresin during 2001 to 2010. During 2001, USA imported the pepper oleoresin worthy 4170 US Dollar. The value for the Germany was 1084 US Dollar during 2001. However it has tremendously increased to 9567 US Dollar during 2010 and Germany Imported 3731 US Dollar followed by Russia, Canada. It shows that they are the largest importer of Indian pepper oleoresin.

5. Conclusion

Demand from the overseas and domestic buyers have reduced due to selling in commodity futures Markets. Quality has been a tradition in the spice trade of India and to maintain this tradition and to be in keeping with modern developments in the field of standardization of agricultural produce. The Government of India has prescribed standards for almost all spices pepper. Pepper prices in the intraday are expected to trade in sideways manner due to reduced demand from the domestic buyers. In the short term (May) Pepper prices will depend on demand from the domestic and overseas buyers and price parity of the various pepper origins especially Vietnam, India and Indonesia. In the medium to long term (June onwards) prices is likely to take cues from demand from the overseas and domestic market, pepper production in Indonesia and Brazil.

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