

STRATEGIC MARKET SEGMENTATION OF A TEA COMPANY IN SOUTH INDIA

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A) INTRODUCTION

Indian tea is among the finest in the world owing to strong geographical indications, heavy investment in tea processing units, continuous innovation, augmented product mix and strategic market expansion. All forms of tea in India start off as a green leaf from the plant *Camellia Sinensis*. Largely three types of tea are processed and made depending on the level of fermentation, namely green tea (unfermented) oolong tea (semi-fermented) and black tea (fully fermented).

Global tea consumption is expected to continue rising over the next ten years primarily due to demand from China, India and other emerging countries. Tea is moving from a space of daily consumption in the emerging countries to a more lifestyle space boosted by more expensive and innovative variants available in the market today.

Tea is the most widely consumed beverage in India. The country is globally the second-largest tea grower and has the largest tea-drinking population. Approximately 80% of the tea grown in India is consumed domestically. However, despite this, the per-capita consumption of this beverage is lower in comparison to many other Asian and European countries.

The prominent tea growing states of India are Assam, West Bengal, Tamil Nadu and Kerala. India is known to offer high quality tea from the hills of Darjeeling, Assam and Nilgiri with a unique aroma, flavour and taste. The Indian tea market is expected to grow at a CAGR of 14% from 2017-2021. RTD tea beverage is expected to gain demand among the youth due to its health and wellness claim.

Indian tea is also classified on the basis of the region where it is grown, namely Darjeeling tea, Assam Tea, Nilgiri Tea and Kangra Tea. Assam and Darjeeling Tea come from the eastern parts of India while Nilgiri tea comes from south India's Nilgiri Hills and Munnar while Kangra Tea comes from the Himalayan foothills of northwest India.

B) Tea Export from India and Export Destinations:

- Total tea export from India stood at US\$ 830.90 million in FY19 and US\$ 826.47 million in FY20.
- India stands fourth in terms of tea export after Kenya (including neighbouring African countries), China and Sri Lanka.
- As of 2019, India was the second largest tea producer in the world with production of 1,339.70 million kgs.
- In April 2021, estimated tea production in India stood at 73.44 million kgs.
- The total tea export was US\$ 755.86 million in April 2020 to March 2021 and for March 2021 it was US\$ 53.35 million.
- In April 2021, export of tea stood at US\$ 49.73 million.
- The country is home to a wide variety of teas, including CTC tea, orthodox tea, green tea and organic tea. Unlike many other teas producing and exporting nations, India has a manufacturing base for both CTC and orthodox tea in addition to green tea.
- India offers high-quality specialty teas, such as Darjeeling, Assam Orthodox and the high-range Nilgiris, which have a distinctive aroma, strength, colour and flavour.

C) OBJECTIVES OF THE STUDY

The following are the important objectives of the study prepared is:

- To analyse the production and sales of tea in South India region
- To analyse the production of tea in South Indian states.
- To analyse the export of tea from South India to other countries.
- To find out the trends in export of quantity and value of tea from India.

D) ANALYSIS OF THE STUDY

As a part of market segmentation research, we have covered the important aspects and analysis using machine learning and data analysis of overall export, production and cultivation of tea crop in India. To support the above methodology it has been found from the research that Assam, West Bengal, Tripura, Himachal Pradesh, Tamil Nadu, Kerala and Karnataka are the important states of tea cultivation in India and market share between the tea industries from past 25 years.

So before proceeding with the segmentation analysis of tea industry and performance in South Indian states, following are the important characteristics based on various segmentation parts:

Demographics

Segmentation of customers of tea based on demographic factors is

- Income

Psychographics

Psychographic Segmentation groups customers according to their life-style and buying psychology.

1) Lifestyle

- Working class
- middle class
- Upper middle class

2) Values

Behaviour Segmentation

Markets can be segmented on the basis of buyer behaviour as well.

- Usage
- Loyalties

DATASETS USED:

- UPASI Statistics: <http://www.upasi.org/latest-statistics/>
- Global Coffee/Tea Production/Consumption Kaggle dataset: <https://www.kaggle.com/michaellight/globalcoffee-production-consumption>
- Tea Board of India <http://www.teaboard.gov.in/WEEKLYPRICES/2021>
- Coffee export dataset: [https://www.kaggle.com/search?q=psd coffee+authorUserName%3Amichaellight](https://www.kaggle.com/search?q=psd+coffee+authorUserName%3Amichaellight)

E) MARKET SEGMENTATION:

- **DATA ANALYSIS OF TEA AND AGRICULTURAL CROPS MARKET SEGMENTATION:**

Based on the territories and Indian states, we have divided the categories into different regions, that is, North India, South India and North East India in order to determine which state is producing which crop and how rapidly it is being produced.

```
In [20]: north_india = ['Jammu and Kashmir', 'Himachal Pradesh', 'Uttar Pradesh', 'Chandigarh']
south_india = ['Andhra Pradesh', 'Karnataka', 'Kerala', 'Tamil Nadu', 'Telangana']
north_east_india = ['Assam', 'Sikkim', 'Nagaland', 'Meghalaya', 'Manipur', 'Mizoram', 'Tripura', 'Arunachal Pradesh']

In [21]: def get_zonal_names(row):
    if row['State_Name'].strip() in north_india:
        val = 'North Zone'
    elif row['State_Name'].strip() in south_india:
        val = 'South Zone'
    elif row['State_Name'].strip() in north_east_india:
        val = 'NE Zone'
    else:
        val = 'No Value'
    return val

data['Zones'] = data.apply(get_zonal_names, axis=1)
data['Zones'].unique()
```

Now to determine the agricultural crop production in different regions we have grouped into respective types and it can be found that Kerala, Tamil Nadu, Andhra Pradesh are few of the major states that produces different crops out of which Tea and Coffee has the major ratio with respect to agricultural crops.

```
In [21]: crop=data['Crop']
def cat_crop(crop):
    for i in ['Peach','Apple','Litchi','Pear','Plums','Ber','Sapota','Lemon','Pome Granet',
            'Other Citrus Fruit','Water Melon','Jack Fruit','Grapes','Pineapple','Orange',
            'Pome Fruit','Citrus Fruit','Other Fresh Fruits','Mango','Papaya','Coconut','Banana']:
        if crop==i:
            return 'Fruits'
    for i in ['Tobacco','Coffee','Tea','Sugarcane','Rubber']:
        if crop==i:
            return 'Commercial'

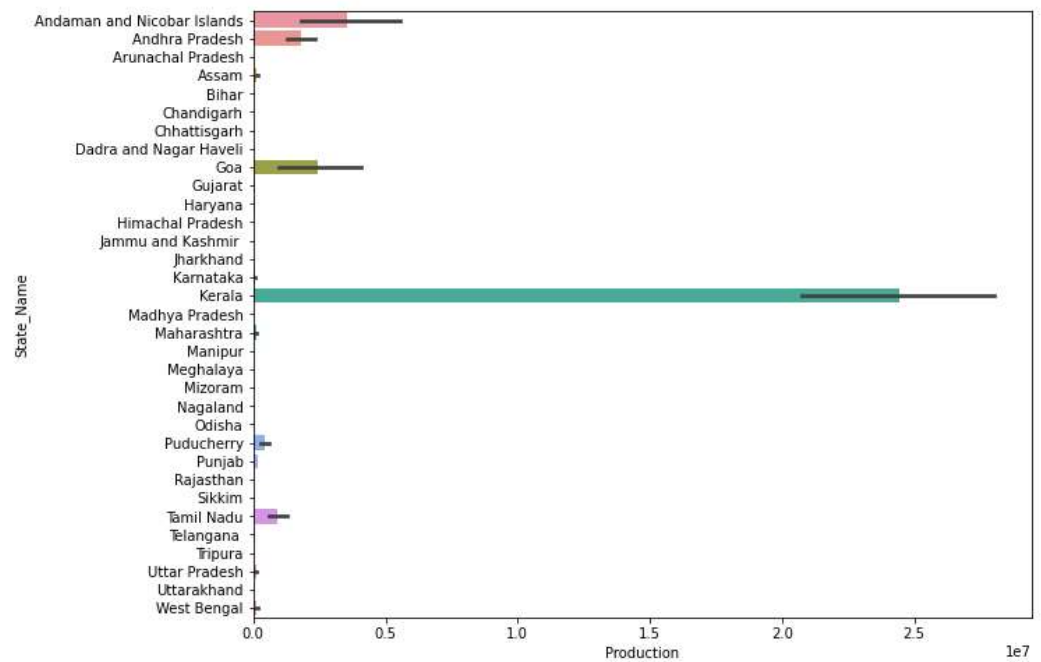
data['cat_crop']=data['Crop'].apply(cat_crop)

In [22]: data["cat_crop"].value_counts()
Out[22]: Commercial    10561
Fruits                8153
Name: cat_crop, dtype: int64

In [23]: data_explore = data.copy()

In [24]: plt.figure(figsize=(10,8))
sns.barplot(x=data['Production'],y= data['State_Name'], orient='h')
```

```
Out[24]: <AxesSubplot:xlabel='Production', ylabel='State_Name'>
```

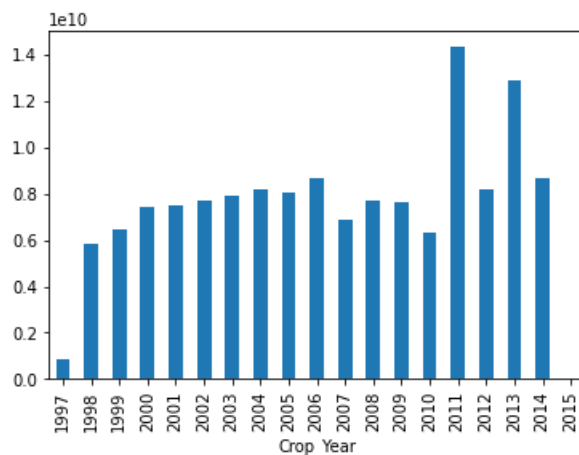


- YEAR WISE PRODUCTION OF TEA AND OTHER CROPS:**

From the below snippet, to check the production of crops year wise from past 20 years, it can be concluded that year 2011 and 2013 has been the largest producer years overall.

```
In [25]: plt.tick_params(labelsize=10)
data_explore.groupby("Crop_Year")["Production"].agg("sum").plot.bar()
```

```
Out[25]: <AxesSubplot:xlabel='Crop_Year'>
```

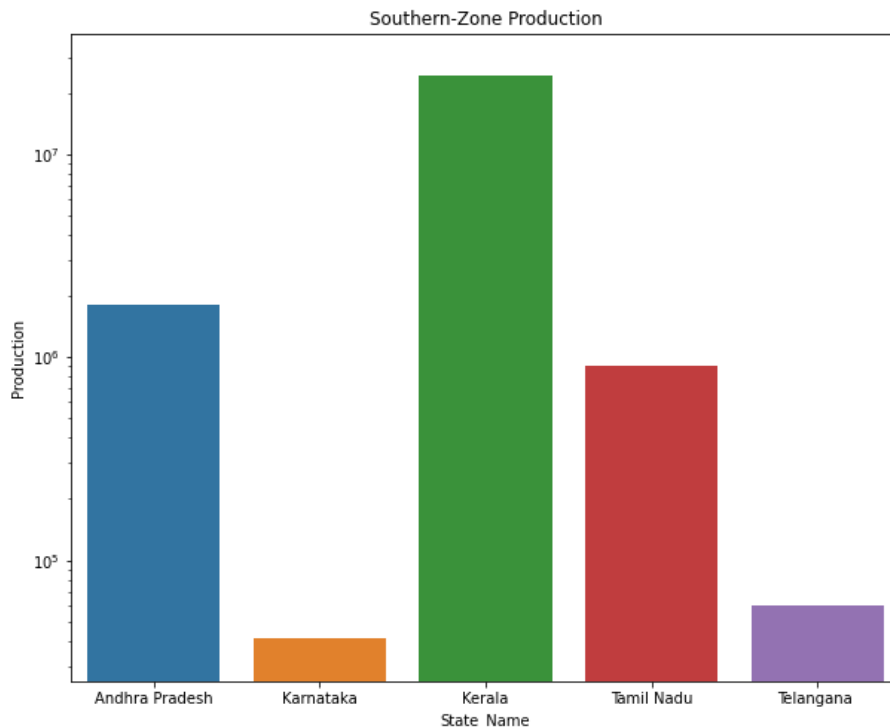


- **PRODUCTION AND ZONE WISE DISTRIBUTION:**

From the above data to check which state from South India is producing crops especially tea crop, the below visualization graphic shows that Kerala has the highest production of crops.

```
In [29]: south_zone = data_explore[(data_explore["Zones"] == 'South Zone')]
fig, ax = plt.subplots(figsize=(10,8))
sns.barplot(south_zone.State_Name, south_zone.Production, errwidth=0)
plt.yscale('log')
plt.title('Southern-Zone Production')
```

Out[29]: Text(0.5, 1.0, 'Southern-Zone Production')



- **EXPORT RATE OF TEA AND COFFEE:**

The value component essentially means the monetary capital (in lakhs) associated with 1000 60kg bags of Coffee grown per year in India (over a period of 5 years). Also, we notice that the export of coffee is much higher than the import of coffee and this implies the presence of a sustainable international customer base for Indian tea as well as coffee, grown in South India. Thus, to incentivize the farmers in South India, essential customer base knowledge should be provided to them to encourage them to produce more amount of tea than produced earlier or presently.

Not only this, among tea and coffee export statistics from year 2010 onwards till current year, from 2012-2018 export of coffee has increased rapidly that is the total production of coffee export is nearly 62.45 lakh rupees (in billion) as compared with tea export statistics. So to determine the future export upto 5-7 years it can be said that India will be the largest Asian country of tea and coffee production, export and import, supply demand, etc., especially in South and North India region.

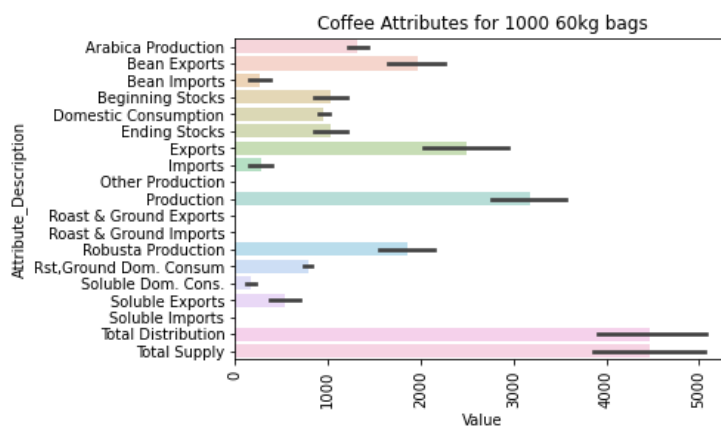
```
In [9]: export_df.head()
```

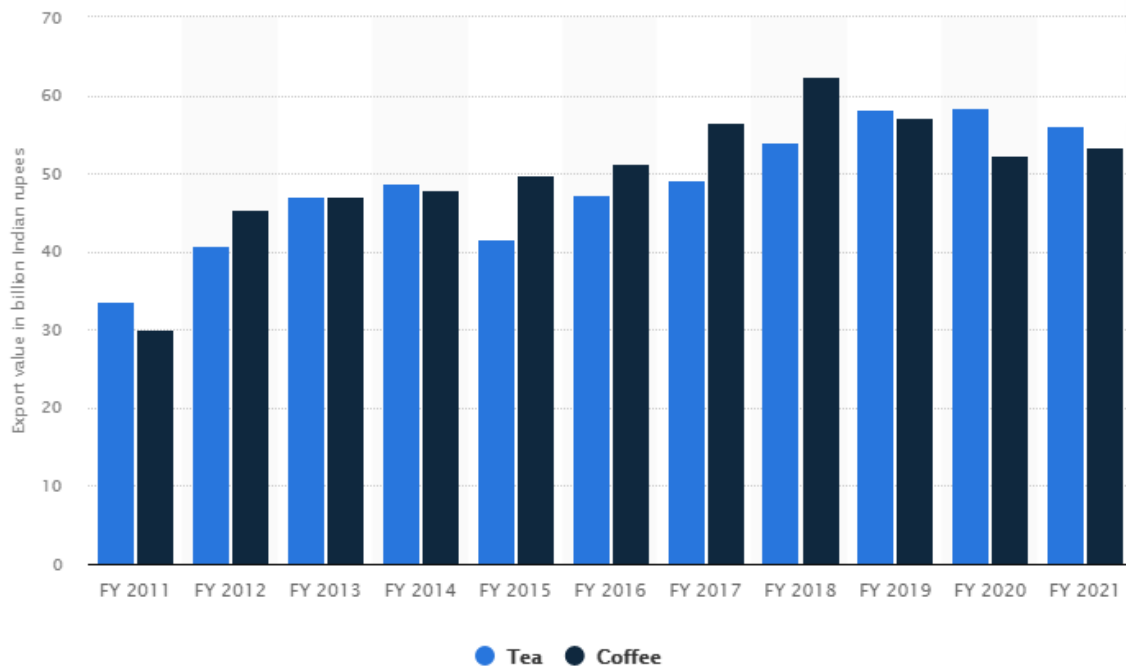
```
Out[9]:
```

	Commodity_Code	Commodity_Description	Country_Code	Country_Name	Market_Year	Calendar_Year	Month	Attribute_ID	Attribute_Description	Unit_ID
0	711100	Coffee, Green	AG	Algeria	2003	2012	6	29	Arabica Production	2
1	711100	Coffee, Green	AG	Algeria	2003	2012	6	90	Bean Exports	2
2	711100	Coffee, Green	AG	Algeria	2003	2012	6	58	Bean Imports	2
3	711100	Coffee, Green	AG	Algeria	2003	2012	6	20	Beginning Stocks	2
4	711100	Coffee, Green	AG	Algeria	2003	2012	6	125	Domestic Consumption	2

```
In [12]: sns.barplot(data=export_df,y='Attribute_Description',x='Value',alpha=0.4,orient='h')
plt.xticks(rotation='90')
plt.title("Coffee Attributes for 1000 60kg bags")
```

```
Out[12]: Text(0.5, 1.0, 'Coffee Attributes for 1000 60kg bags')
```



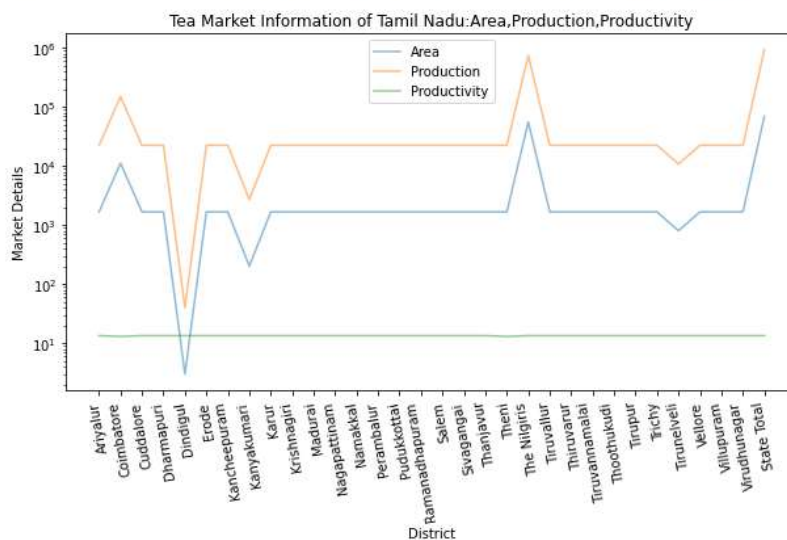


From South Indian states, Tamil Nadu has the largest tea market share and distribution in terms of area, production and productivity.

```
In [19]: fig,ax=plt.subplots(figsize=(10,5))
sns.lineplot(data=tea_data,x='District',y='AREA',markers=True,ax=ax,alpha=0.5,label='Area')
sns.lineplot(data=tea_data,x='District',y='PRODN.',markers=True,ax=ax,alpha=0.5,label='Production')
sns.lineplot(data=tea_data,x='District',y='PTY.',markers=True,ax=ax,alpha=0.5,label='Productivity')

plt.yscale("log")
plt.ylabel("Market Details")
plt.xticks(rotation='100')
plt.title("Tea Market Information of Tamil Nadu:Area,Production,Productivity")
```

```
Out[19]: Text(0.5, 1.0, 'Tea Market Information of Tamil Nadu:Area,Production,Productivity')
```



```
In [141]: tea_production=pd.read_csv('C:\Users\WV\OneDrive\Desktop\Dataset\Tea_Production.xlsx')
```

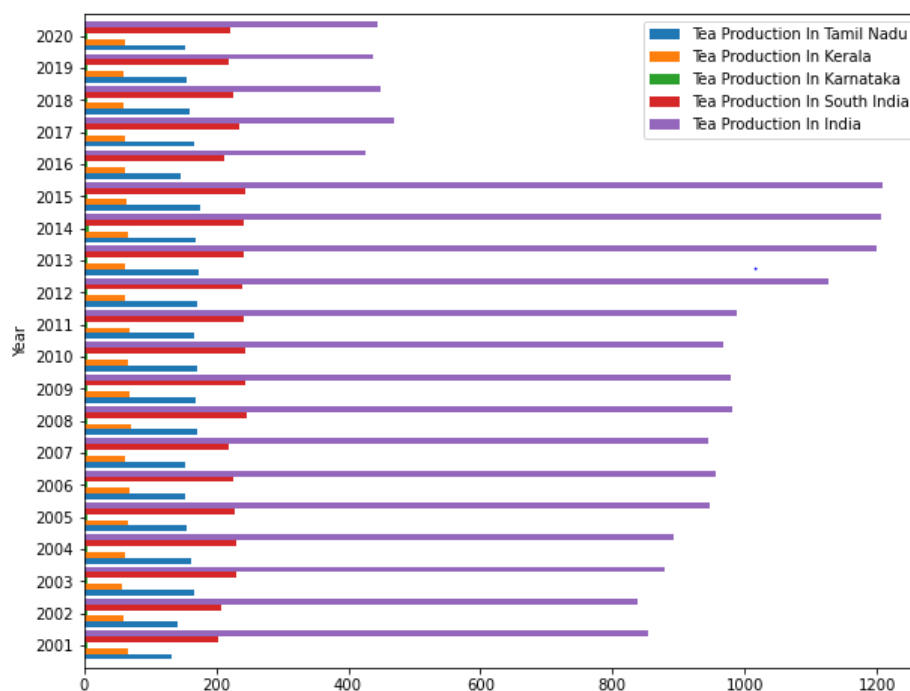

- **OVERALL YEAR-WISE PRODUCTION OF TEA IN INDIA COMPARING WITH SOUTH INDIAN STATES:**

From the below graphic visualization, we have checked the distribution of tea production in Indian states from year 2001 onwards (upto 2020), South Indian states has dominated rightly from the beginning for producing tea, thereby having the major agricultural boost sector comparing with Tamil Nadu, Kerala and Karnataka states of different tea companies planted in India.

Hence, with all the analysis we performed, South India as well as North India will have the major impact of tea and coffee in terms of production, export and import statistical rate, productivity, etc.

```
In [26]: tea_production.set_index('Year').plot(kind='barh',figsize=(10,8),width=0.9)
```

```
Out[26]: <AxesSubplot:ylabel='Year'>
```



F) Further Insights from the report:

From India tea is exported in almost every corner of the world from ages. Indian tea is considered as the best in the world because of geographical indications and heavy investment in tea processing units. In recent years Indian tea industry faced many high and lows due to the proportional reduction in cultivation area, slow increase in yield and increase in domestic consumption.

But still India managed to retain its position in the export market of tea globally. Moreover India can gain and retain its position by providing various qualities and flavours to the global market.

Looking at the poor performance of India's tea export in recent past, the prospects for Indian tea export seems to be very weak. However, tea being income elastic, and high elasticity for developing countries and in recent years, the import share of developing countries in world import is increasing. India's share of export in these developing countries is also increasing. With these developments one may infer, India's prospect for tea are optimistic, provided if India improves its export strategy and makes more availability of export surplus by improving its yield.

Export of tea from India is significantly an increasing trend. It is due to the effort of the Government of India through the Tea Board. It also explained about the different varieties of tea produced and marketed in India and Foreign countries. India and China are the major tea producing countries of the world. India and China are also the major tea exporters in this world. Tea industry is playing very important role in tea producing countries because it gives major income for the country. Tea is one of the oldest industries in India and today it showcases the status of one of the best organized industries in the country.

G) References:

- 1) Production and export performance of coffee in India:
https://www.researchgate.net/publication/339375636_Production_and_export_performance_of_coffee_in_India
- 2) Statista Total production of tea from 2014-2020 in India:
<https://www.statista.com/statistics/652078/teaproduction-in-south-india/>
- 3) Tea Industry in India–Analysis of Import and Export of Tea:
[https://www.ijbmi.org/papers/Vol\(2\)8/Version-1/B028109015](https://www.ijbmi.org/papers/Vol(2)8/Version-1/B028109015)
- 4) Performance of India's Tea Exports: A Comparative Study of Major Tea Exporting Countries of The World:
https://www.researchgate.net/publication/326470204_Competitiveness_and_Performance_of_Tea_Exports_of_India
- 5) Tea and coffee export values:
<https://www.statista.com/statistics/623655/tea-and-coffee-export-values-india/>

6) QUALITY ANALYSIS OF TEA WITH THE HELP OF MACHINE
LEARNING ALGORITHMS:

[https://www.researchgate.net/publication/342701366 APPLICATION
OF MACHINE LEARNING TECHNIQUES IN QUALITY ANALYSIS OF TE
A](https://www.researchgate.net/publication/342701366)

