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**ADDIS ABABA UNIVERSITY  
SCHOOL OF GRADUATE STUDIES  
DEPARTMENT OF MANAGENET**

**DATA DRIVEN MANAGERIAL DECISION MAKING IN  
ETHIOPIAN EXPORT SECTOR**

**By**

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**June, 2021**

**Addis Ababa, Ethiopia**

**ADDIS ABABA UNIVERSITY**  
**SCHOOL OF GRADUATE STUDIES**  
**DEPARTMENT OF MANAGEMENT**

**DATA DRIVEN MANAGERIAL DECISION MAKIN IN**  
**ETHIOPIAN EXPORT SECTOR**

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**June,2021**

**Addis Ababa**

## **DECLARATION**

I hereby declare that this thesis is my original work and has not been submitted for examination before for the award of other degree or qualification in any other University and all sources of materials used fully acknowledged.

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# **DATA DRIVEN MANAGERIAL DECISION MAKING IN ETHIOPIAN EXPORT SECTOR**

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## Abstract

*With the development and deployment of ICT in different sector of an Economy, the type and amount of data collected by organizations is increasing from time to time. This created the concept of big data, data analytics, business intelligence and or data driven decision making. In line with this, almost all organizations are collecting and maintaining some sort of data/information about their business. But it is not common to see many organizations analyzing their collected data and use for decision making. This problem is common among organizations in developing countries. Ethiopia is not an exception. From this perspective, the objective of this study is to explore the hidden insight behind the data by applying business intelligence tool tableau. The study followed exploratory research approach; it intends to see the relationship among product category, value, volume, destination and year of export and used visualization as research design. The study used secondary data from the period 2007 to 2020 G.C, collected from Ethiopian Ministry of Trade. Business intelligence software Tableau was used to analyze the data.*

*The finding is very impressive. The analytics tool revealed that there is much insightful information hidden inside the huge data set. Insights related to trend and relationships among some key data variables is interesting particularly for CEOs that don't have to crunch every data in detail. The different tables that results from the analysis revealed the importance of data analytics. Particular emphases can be given to the visualization feature of the tools.*

**Keywords:** *Business Analytics, big data, data driven decision making, Tableau*

# Table of Content

Acknowledgment .....	i
Abstract .....	ii
Acronyms .....	v
List of Figures .....	vi
CHAPTER ONE .....	1
Introduction .....	1
1.1. Background of the Study.....	1
1.2. Statement of the problem .....	3
1.3 Research questions .....	4
1.3.1Main research question .....	4
1.3.2 Sub research questions.....	4
1.4 Objectives of the study .....	5
1.5 Significance of the Study.....	5
1.6 Scope/Delimitation of The Study.....	6
1.7. Contribution of the study.....	6
1.8. Definition of Terms or Concepts.....	6
1.9. Organization of the Paper .....	7
CHAPTER TWO .....	8
Literature Review .....	8
2.1 Introduction .....	8
2.2 Theoretical Review.....	8
2.2.1 Business analytics.....	8
2.2.2. The three categories of Business Analytics.....	9
2.2.3 Data Analytics .....	10
2.2.4. There are four primary types of data analytics.....	10
2.3. Data Visualization.....	11
2.3.1. Importance of data visualization .....	11
2.3.2. Subfields of data visualization.....	12
2.4 Data driven Decision Making .....	13

2.5. EMPERICAL REVIEW .....	13
CHAPTER THREE .....	16
Research design and Methodology.....	16
3.1 Introduction .....	16
3.2 Research Approach .....	16
3.2 Research Design .....	16
3.3 Sources and types of data, and collection method .....	16
3.4. Data Preparation.....	17
3.4.1. Data Cleaning .....	18
3.4.2 Transforming Data .....	21
3.5 Data Analysis Method .....	24
3.6. Tableau.....	25
3.7 Power BI .....	26
CHAPTER FOUR .....	28
Results and Discussion .....	28
4.1. Introduction .....	28
CHAPTER FIVE .....	61
Summary Conclusion and Recommendation.....	61
5.1. summary .....	61
5.2. Conclusion.....	62
5.3. Recommendation.....	62
5.4. Limitation and Future research direction .....	63
Reference .....	64
APPENDIX 1 Annual Export performance report of Ministry of Trade .....	69
APPENDIX 2 Description of the product categories.....	76

## Acronyms

**UNCTAD** United Nation Conference on Trade and Development

**NBE** National Bank of Ethiopia

**AGOA** African Growth and opportunity Act s

**COMESA** Common Market for Eastern and Southern Africa

**EBA** Everything But Arms

**AfCFTA** African Continental Free Trade Area

## List of Figures

Figure 1 category and destination

Figure 2 Category of Products and related values of export

Figure 3 Category and weight of the exported category of products

Figure 4 category, value and weight

Figure 5 category, value and year

Figure 6 destination and year

Figure 7 category and value

Figure 8 Weights and Category

Figure 9 category, value and weight

Figure 10 Value, category and year

Figure 11 category and destination

Figure 12 destination and year

# CHAPTER ONE

## Introduction

### 1.1. Background of the Study

The concept of Business intelligence and analytics (BI&A) has been gaining attention from academicians and business practitioners over the last few years. Business intelligence and analytics refers to “the techniques, technologies, systems, practices, methodologies, and applications that analyze critical business data to help an enterprise better understand its business and market and make timely business decisions (Chen et al.,2012). Improved levels of BI&A enhance tasks and lead to improving the data-driven insights among decision-makers. To effectively collaborate and search for new knowledge from multiple points in time, firms rely on BI&A to realize value from the technology to generate diverse data insights (Awan et al.,2021).

Business analytics, a data management solution and business intelligence subset, is the combination of skills, technologies and practices used to examine an organization’s data and performance as a way to gain insights and make data- driven decisions using statistical analysis. According to Acito and Khatri (2014) business analytics is about grasping value from data, data can be employed for purposes such as detecting new opportunities and identifying potential market.

The application of business analytics in the modern era can be traced back to the Second World War. The advent of business computers back in the 1970s led to a range of applications tailored for corporate use. Business analytics in this era were headed by decision support system. The emergence of business analytics as an important area of study has several reasons; first the ready availability of large amounts of data, this leads to unprecedented challenges of large data. Processing large data is difficult and requires new approaches and advanced technologies. Besides increase realization that data is a valuable resource and should be managed as an asset. Second the maturity of business performance management in the last five decades has helped create a more solid bridge between business strategy and data. Third the realization that fact-based decisions are more critical at every level of the organization (Cao et al., 2015; Acito & Khatri, 2014).

With the availability of vast amounts of data, companies in almost every industry are focused on exploiting data for competitive advantage (Mandinach, 2012). The authentic and valuable insights generated from the data are important for the firm, as they can be chosen to formulate appropriate decisions to create new courses of action. Valuable insights generated from diverse data sources to understand past and present trends, as well as predict future trends, can positively influence decision-making quality (Awan et al., 2021).

The effective utilization of resources and effective decision-making among managers are sets of actions to be performed in relation to tasks. Decision-making quality ensures that managers understand what to do and what they are trying to achieve. Decision-making in a digital environment is embedded in a better understanding of data or key information. Knowledge resources may lead to making better decisions inside organizations (Ghasemaghaei, 2019).

Data-driven decision making refers to the systematic collection, analysis, examination, and interpretation of data, usually through the application of analytics methods and techniques, to reach informed decisions (Mandinach, 2012). Also, data-driven decision-making bases decisions on the analysis of data with the intuition and experience of decision maker (Provost & Fawcett, 2013).

According to Brynjolfsson and Kim (2010) business performance can be improved significantly via data-driven decision making. Firms that emphasize decision making based on data and business analytics (data driven decision making) show higher performance, they developed a measure of data driven decision that rates firms as to how strongly they use data to make decisions across the company. They show statistically that the more data-driven a firm is, the more productive it is.

Large data is difficult to be handled with traditional data processing application, analyzing and visualizing the data sets can give a new trade trends, and forecast potential market. (Wang et al., 2015). Nowadays, the most used tools for data analytics and visualizations, data discovery are Tableau and Power BI (Milligan, 2015). Tableau is one of the fastest upcoming business intelligence (BI) tool. It is fast to deploy, easy to learn and very useful for a user. Tableau is a software that can help users explore and understand their data by creating interactive visualizations. The software has the advantages that it can be used in conjunction with almost

any database, and it is easy to use by dragging and dropping to create an interactive visualization expressing the desired format. (Akhtar et al., 2020).

However, despite the growing amount of data, tools, and insights, decision makers are still not fully utilizing the power of current technologies (Elgendy et al., 2021). Research that tries to look inside what existing data shows and reveal doesn't exist. In line with this, the current study use export data of the country and try to find useful insights that help managers in this area make an informed decision.

## 1.2. Statement of the problem

Like most of the Sub-Saharan African countries and other developing countries, the Ethiopian economy is dependent on the export of primary and low value added products (Kamma, 2020). Coffee is still the dominant commodity in Ethiopian export sector with share of 31.1 percent in 2019 (NBE 2020). “Very impressive export performance has been achieved in real term mainly due to strong economic growth, devaluation of local currency in different times; incentive schemes such as duty draw-backs and industrial zone schemes; and abolishment of all taxes on export with few exceptions” (Kamma, 2020) .Besides, Ethiopia is centrally located globally and an air hub for Africa, and has been accessing free trade agreements such as Common Market for Eastern and Southern Africa (COMESA) , Everything But Arms (EBA), and the African Growth and Opportunities Act (AGOA). However, the export-to-GDP ratio is being low, on average, it was 7.6 per cent in 1980 and 9.65 percent over 1980-2018 (Kamma, 2020). Also the country characterized by shortage of foreign exchange and it has been putting a negative influence on public and private investments boom (Kamma, 2020; Bereket, 2020)

According to Ministry of Trade (MOT) annual export performance report, Ethiopia export data which includes volume amount, category, destinations, HS description, Commercial description, and year, collected and stored in excel sheet and analyzed using tables and normal graphics, there is lack of approach that systematically identifying why and how exporting varies, some commodities show increment in some years and the other declines, also having difficulties that systematic export market selection through the identification of new export opportunities for firms wanting to expand their sales reach into foreign markets and also alternatives to exporters where they are facing saturation or declining growth in their exporting markets. Understanding

and making decision based on large data set has becomes a challenge, traditional processing application do not have the capabilities to analyze large data and address the decision-making needs. (Elgendy & Elragal, 2014).

Normal graphics reports used to clarify and proof decision making process only with normal limited view ,the goals for usual graphs and charts can be summarized in delivering the idea, explanation, simplicity, evidence, excitement and importance. Oppositely, the objectives of the data visualization are based on the analysis to explore the relations and trends. (Alharthi & Gutub, 2017).

It is not the amount of data that is important but what matters is how to create value with this data in order to improve export performance of the country. A correct relevant business decision based on large volume of data is difficult with the traditional decision-making method. (Elgendy&Elragal, 2014). This results in making decisions as business as usual manner. Getting insights from volume of data that collected over the years is not used in the decision making particularly in formulating strategies to boost the export sector and meet the targets.

Although the export sector is very essential for the country, there are no studies conducted on what export performance data disclose. The previous studies in Ethiopia have focused to determinants of export performance on individual category of products, thus this paper tried to fill this gap.

### 1.3 Research questions

The key research questions addressed in this study are:

#### 1.3.1 Main research question

What are the hidden insights in the export data of the country?

#### 1.3.2 Sub research questions

Examine and explore in which years did the country have its maximum and minimum export of its agricultural, mineral, and manufacturing items?

What is the trend of export volume of item categories across 2007-2020?

Which products and or item categories are the most favored to which countries. This means, which items are exported to where?

What is the trend of export items with respect to its volume and value?

Does data visualization able to indicate potential foreign market?

## 1.4 Objectives of the study

### **General objective**

The main objective of this study is to explore hidden insight behind the data by applying business intelligence tool tableau.

### **Specific Objectives**

To examine and explore in which years did the country have its maximum and minimum export of category of products.

To examine the trend of export items in relation to vale and volume

To examine the export trend of volume of item categories across 2007-2020

To identify which categories are most exported to which country

To identify potential foreign market

## 1.5 Significance of the Study

The study would give valuable insights how to use business analytics to improve decision-making. The study has alsosignificance foracademicians, practitioners and government policy makers to build a good understanding of the study area. The study can be used as a bench mark for others to follow suit this kind of study in the future. Unlike many other studies, this one has got more practical applications than the usual theoretical studies. That is why; the organization

hasn't resisted to give data for this study. The findings from this study will help the country to enhance its competitiveness in international business.

## 1.6 Scope/Delimitation of The Study

The study used thirteen years data (from 2007 to 2020) because of time constraints and accessibility of the data. However, it could have been better to add more data. From analysis perspective, the study will not intend to do modeling research. Rather, it emphasis on visualizing the huge data set that is collected by the organization. Such visual analytics helps CEOs and top managers easily understand how their business is trending with respect to items they export, volumes and values they earn from the exports as well as their destinations and benefits they rip from. Such visual analysis and presentation save managers save their time of understanding the operation. Thus, scope wise, the research emphasized on visual presentation of insightful information than modeling aspect, which is common in other studies.

## 1.7. Contribution of the study

As stated in the above section, this study has key contributions: (1) it helps practitioners to apply the concepts/ tools of visualization to their huge data sets and extract important insights, (2) it can somehow bring practical and problem solving research approaches that can be used as an exemplary for other students to follow. Moreover, the practical demonstration of the tool used (Tableau) is also an important contribution to mention.

## 1.8. Definition of Terms or Concepts

**Business Intelligence-** Comprises the strategies and technologies used by enterprises for the data analysis of business information.

**Business analytics-** is the process by which business use statistical methods and technologies for analyzing historical data.

**Data** –facts and statistics collected together for analysis

**Data-driven decision making** –is the process of making organizational decisions based on actual data rather than intuition/observation alone.

**Tableau**-is the fastest data visualization and data analytics tool

## 1.9. Organization of the Paper

This thesis is organized into five chapters. Chapter one provides a brief overview of research background, statement of research problem, research questions, objectives of the study, significance of the study, delimitation/scope, and contribution of the study and definition of terms. Chapter two briefly discussed related literature on business analytics. Chapter three reports the research paradigm, research approach, research design, research strategy, sources of data, data analysis method. In chapter four of the study, visual analysis of the study is presented as well as interpretation of the result. Chapter five summarizes, concludes with the thesis findings are forwarded. It also addresses suggestions for future research.

## CHAPTER TWO

### Literature Review

#### 2.1 Introduction

This chapter provides theoretical and empirical literature review that is relevant for this study. It therefore starts with a theoretical literature review followed by empirical one basically deals with business analytics, data analytics and data visualization both theoretically and empirically.

#### 2.2 Theoretical Review

##### 2.2.1 Business analytics

Business analytics defined as “the application of process and techniques that transform raw data into meaningful information to improve decision making” (Wilder&Ozgur, 2015). Business analytics is the application of analytics to business problems(Power et al.,2018). Business analytics is the iterative exploration of an organization ‘s data with a focus on applying statistical analysis techniques to reveal information that can help drive innovation and financial performance. Business analytics can be defined as “a process beginning with business-related data collection and consisting of sequential application of descriptive, predictive, and prescriptive major analytic components, the outcome of which supports and demonstrates business decision-making and organizational performance” (Schniederjans et al.,2014).

Business analytics has been existence since very long time and has evolved with availability of newer and better technologies. It has its roots in operations research, which was extensively used during World War II. Operations research was an analytical way to look at data to conduct military operations. Over a period of time, this technique started getting utilized for business. Operation’s research evolved into management science. Again, basis for management science remained same as operation research in data, decision making models. As the economies started developing and companies became more and more competitive, management science evolved into business intelligence, decision support systems and into PC software (Cao et al,2015; Holsapple,2014).

Application and use of Business analytics has many benefits that; Businessanalytics is a methodology or tool to make a sound commercial decision, it impacts functioning of the whole organization. Hence, it can help improve profitability of the business, increase market share and revenue. Business analytics facilitates better understanding of available primary and secondary data, which again affect operational efficiency of several departments. It provides a competitive advantage to companies. In this digital age flow of information is almost equal to all the players. It is how this information is utilized makes the company competitive. Business analytics combines available data with various well thought models to improve business decisions. It converts available data into valuable information. This information can be presented in any required format, comfortable to the decision maker (Gavin, 2019).

Business analytics has a wide range of application and usages. It can be used for descriptive analysis in which data is utilized to understand past and present situation. This kind of descriptive analysis is used to asses' current market position of the company and effectiveness of previous business decision. It is used for predictive analysis, which is typical used to asses' previous business performance. Business analytics is also used for prescriptive analysis, which is utilized to formulate optimization techniques for stronger business performance (Delen,2018).

### 2.2.2. The three categories of Business Analytics

**Descriptive analytics** answers the question what has happened; it evaluates historical data for insights on how to plan for the future(Evans& Lindner, 2012).

**Predictive analytics**uses machine learningand statistical techniques to help business anticipate the likelihood of future events. It is probabilistic in nature so it can not actually predict the future only suggest the most likely outcome based on what has happened in the past (Evans &Lindner ,2012).

**Prescriptive analytics**explores possible actions to take based on the results of descriptive and predictive analysis. It combines mathematical models and business rules to optimize decision making by recommending multiple possible responses to different scenarios and tradeoffs (Evans & Lindner, 2012)

### 2.2.3 Data Analytics

Data analytics is the process of getting raw data and examining that information in order to identify patterns and draw conclusions. It is obtaining data, reviewing the data, analyzing it and pulling great insights out of that information to allow companies and organizations to make better, more effective business decisions and strategic business moves.(Keyes,2016; Monnappa, 2021).

Data analytics is the science of integrating heterogeneous data from diverse sources, drawing inferences, and making predictions to enable innovation, gain competitive business advantage, and help strategic decision-making (Gudivada,2017).

Data analytics involves the manipulation and computation of large volumes of data, often from a wide variety of different sources. Manipulation and computation are performed at high velocity to identify patterns, correlations, and other useful information (Pagano&Liotine,2019). Data analytics involves combining through massive datasets to reveal patterns and trends, draw conclusions about hypotheses, and support business decisions with data-based insights (Stedman, 2016).

### 2.2.4. There are four primary types of data analytics

**Descriptive analytics** answers questions about what happened. It summarizes large datasets to describe outcomes. It includes the collection of relevant data, processing of the data, data analysis and data visualization, it provides essential insight into past performance (Bekker, 2019).

**Diagnostic analytics** answer questions about why things happened. Diagnostic analytics take the findings from descriptive analytics and dig deeper to find the cause(Bekker, 2019).

**Predictive analytics** deals with what will happen in the future based on historical data to identify trends and determine if they are likely to recur. It provides valuable insight into what may happen in the future. Predictive analytics uses a variety of statistical and machine learning techniques (Bekker, 2019).

**Prescriptive analytics** about what should be done or taking actions by using insights from predictive analytics, data driven decision can be made, this helps to make informed decision during uncertainty. It relies on machine learning strategies that can find patterns in large datasets (Bekker, 2019).

### 2.3. Data Visualization

Data visualization is the representation of data in a graph, chart or other visual format, visualization can help to deal with more complex data and enhance memory. It communicates relationships of the data with images. It has huge importance that allows trends and patterns to be more easily seen. Data visualization is not only important for data scientists and data analyst it is used across all industries to increase sales with existing customers and target new markets and demographics for potential customers. Data visualization main goal is to distill large datasets in to visual graphics to allow for easy understanding of complex relationships with in the data. (Akhtar et al, 2020; Oliveira 2020).

The out of the box observation of the data based on the link between unexpected factors shows relation of different ideas, and try to come up with new questions and axis for research .Normal graphics was complementary reports used to clarify and proof decision making process only with normal limited view to the data exactly as needed to persuade the management and leaders teams. The goals for usual graphs and charts can be summarized in delivering the idea, explanation, simplicity, evidence, excitement and importance. Instead, the objectives of the data visualization are based on the analysis to explore the relations and trends (Alharthi& Gutub,2017).

#### 2.3.1. Importance of data visualization

With so much data, it's become increasingly difficult to manage and make sense of it all. It would be impossible for any single person to wade through data line-by-line and see distinct patterns and make observations. Need data visualization because a visual summary of information makes it easier to identify patterns and trends than looking through thousands of rows on a spreadsheet. It's the way the human brain works. Since the purpose of data analysis is to gain insights, data is much more valuable when it is visualized. Even if a data analyst can pull

insights from data without visualization, it will be more difficult to communicate the meaning without visualization (Akhtar et al., 2020).

### 2.3.2. Subfields of data visualization

Data visualization is the presentation of quantitative information in a graphical form. It means, data visualizations turn large and small datasets into visuals that are easier for the human brain to understand and process. Data visualizations are common in our everyday life, but they often appear in the form of well-known charts and graphs. In terms of business intelligence (BI), these visualizations help users make better data-based decisions. Data visualization transforms raw data into information. Data visualization has three main subfields. (Li,2020; Akhtar et al.,2020).

**Scientific visualization** is the representation of data graphically to gain understanding and insight into the data and its role is to model real world phenomena. This allows the researcher to gain insight into the system that studied information in ways previously impossible. The purpose is to convey the scientific data accurately, reveal underlying structures in data and encourage the exploration of the data. Scientific visualization is an interdisciplinary research and application field in science, focusing on the visualization of three-dimensional phenomena, such as architecture, meteorology, medicine or biological systems. Its purpose is to graphically illustrate scientific data, enabling scientists to understand, explain, and collect patterns from the data. (Akhtar et al.,2020); Brodlie et al.,2012)

**Information Visualization** refers to the use of computer-supported, interactive visual representations of numerical and non-numerical abstract data sets in order to amplify human cognition. It is the art of representing data in a way that it is easy to understand and to manipulate, can help us make sense of information and thus make it useful in our lives. The role of information visualization is to map a more abstract concept into 2D or 3D for decision making and analysis purposes. Graphics such as histograms, trend graphs, flow charts, and tree diagrams all belong to information visualization and the design of these graphics transforms abstract concepts into visual information (Spence, 2001).

**Visual analytics** is an integrated approach that combines visualization, human factors, and data analysis. Visual analytics is a new field that has evolved with the development of scientific

visualization and information visualization, with an emphasis on analytical reasoning through an interactive visual interface. Visual analytics methods allow decision makers to combine their human flexibility, creativity, and background knowledge with the enormous storage and processing capacities of today's computers to gain insight into complex problems. Visual analytics in the context of visualization relates to the areas of information visualization and computer graphics, and with respect to data analysis, it benefits largely from methodologies of information retrieval, data management & knowledge representation as well as data mining (Keimet al., 2008).

## 2.4 Data driven Decision Making

Data driven decision-making identified as a value-adding practice. Data driven decision making uses data through enhanced analytics and related information management structures to provide evidence-based information for decision-maker since, the process of decision-making is performed based on data analysis (Moore,2017).

## 2.5.EMPERICAL REVIEW

Cao et al (2015) made a study on linking business analytics to decision making effectiveness: a path model analysis. The researcher develops a research model that linking business analytics to organizational decision-making effectiveness tested the model using structural equation modeling based on survey data 740 employees of UK enterprises. Their finding shows thatbusiness analytics, through the mediation of a data-driven environment, positively influences information processing capabilities, which in turn have a positive effect on decision-making effectiveness.

Ghasemaghaei (2019) conducted study on Does data analytics use improve firm decision making quality? The role of knowledge sharing and data analytics competency. The researcher used knowledge-based view and data analytics competency literature;Survey data collected from top and middle-level managers from 133 U.S.-based firms. The finding indicates that a theory-based understanding of how data analytics use improves firm decision quality and actionable guidelines for firms regarding the critical resources they need to invest in order to obtain benefits from using data analytics tools.

Bayrak (2015) made study on a review of business analytics: a business enabler or another passing fad, his study uses publicly available data maintained in well-known databases like sciencedirect.com, wiley.com, springer.com, emeraldinsight.com, tandfonline.com, informs.org and dl.acm.org. His finding shows that a growing number of companies rely on business analytics to plan and optimize their business operations, forecast their business outcomes, improve efficiency, make better decisions, offer new products and services and capture new market opportunities

Neubertand Van der Krogt (2018) conducted study on the Impact of Business Intelligence Solutions on Export Performance of Software Firms in Emerging Economies. The study uses qualitative multiple-case-study research design using different sources of evidence, including 15 in-depth, individual face to face interviews with founders, shareholders, and CEOs of Paraguayan software firms. The researchers conclude the results as follows ;only few of the interviewees use business intelligence solutions to support international strategic decision-making processes, but most of them disclose that a desire to use since that will have a positive impact on export performance, and international competitiveness and also there are major factors like transparency of cost and benefits ,excellent client service, and attractive pricing model that determine to select business intelligence solution.

Amabile et al. (2013) on their research Business Intelligence practices for exporting SMEs, they use a sample of 180 exporting manufacturing SMEs which located in the province of Quebec. The researcher concludes that, " the managers' sensitivity, influenced by the level of international commitment, plays a central role in the organization of their intelligence practices".

Shanks and Sharma (2011) on their study of creating value from business analytics systems: the impact of strategy, they use an explanatory case study research approach. The researchers argued that dynamic business analytics capabilities provide a means of understanding how and why business analytics technology may lead to value-creating actions and ultimately to improved firm performance, in addition organizational strategy impact both business analytics technology quality and organizational structure and also value-creating actions.

Research studies in the areas of business intelligence (analytics) are more of an applied research. There are also journals that entirely focus on this kind of studies. For example

(<https://www.journals.elsevier.com/computers-in-industry>). Lessons learned from this journal is that unlike many theoretical reviews and developing conceptualization of study variables, this study tries to investigate the application of data analytics concept in Ethiopian context. As the result, there is no interest and need to make many theoretical reviews.

## CHAPTER THREE

### Research design and Methodology

#### 3.1 Introduction

The previous chapter have provided that the context for review of literature. This chapter moves on to explain how research is designed and provides discussion of the methodology adopted to achieve the desired outcomes and is organized as follows. It describes, research approach, research design, data sources, methods of data collection, data and analysis methods. It is intended to give a clear direction to the researcher and readers on how the study done.

#### 3.2 Research Approach

The study followed exploratory research approach. It intends to see the relationship among product category, value, volume, destination and year of export.

#### 3.2 Research Design

The study used visualization. This design has found to be suitable for this study. The study used secondary data collected from Ministry of Trade. As stated in the objective and problem statement section of this document, the main goal of this study is to explore the application of data analytics to drive insights and trends from huge data sets collected by Ethiopia Ministry of Trade. Thus, unlike many theoretical research studies, this work follows somewhat a different approach. As it involves crunching of some numbers, readers can consider quantitative research. But the objective is to visualize huge data sets and drive insights that enhances managers' decision making. This is called data driven decision making.

#### 3.3 Sources and types of data, and collection method

A formal request letter is issued from the researcher's study program office to Ministry of Trade in request for getting access to the data the organization has maintained for some years (2007-2020). The data is captured in MS-excel into many sheets. As we all know, one excel sheet cannot store values of more than a million record. This even become a challenge to integrate, explore, and analyze the data in holistic manner. The excel data is handed over to the researcher with flash drive and the researcher has made all the necessary cleaning and preparation as discussed below.

### 3.4. Data Preparation

Data preparation is the process of cleaning and transforming raw data prior to processing and analysis. Data preparation can be used in business intelligence, analytics and data visualization applications (Burns, 2020). The whole preparation process consists of a series of major activities including data profiling, cleansing, integration and transformation (Abdallah et al.,2017)

The primary purpose of data preparation is to ensure that raw data being readied for data processing and analysis is accurate and consistent the results of Business intelligence and analytics applications will be valid (Burns,2020)

Originally the data looks like this Data cleaning and filtering is cumbersome and time consuming. The data has two groups the first one is Agricultural and mineral products, and the second group manufacturing products.

	A	B	C	D	E	F	G	H	I	J
1	ASSDATE	HSDSC	CAT_COD	COMERCIALDSC	NWEIGHT	FOB_VALUE_IN_USD	CDESTINATION			
2	09-JUL-19	TANNED/CRUSTS	Animal Products	FINISHED SHEEP SUE	12916	179292.0397	China			
3	29-JUL-19	Butter	Animal Products	KIBE	5	60.7178382	United States			
4	20-JUL-19	Concentrated milk	Animal Products	SECOND GRADE FRESH	49882	4043.504089	Somalia			
5	09-AUG-19	Concentrated milk	Animal Products	SECOND GRADE FRESH	49982	4050.757079	Somalia			
6	31-JUL-19	--OTHER	Animal Products	FISH SALTED BUT NOT I	1000	505.8783709	Sudan			
7	01-AUG-19	FRESH, FROZEN, SA	Animal Products	SHEEP STOMACH, SHEE	29000	50502.97718	Viet Nam			
8	23-JUL-19	---OTHER ANIMAL	Animal Products	BUFFALO-HEAD SKIN, S	113	21450.70043	France			
9	18-JUL-19	---OTHER ANIMAL	Animal Products	DRIED OMASSUM, OX H	20000	8592.403017	Viet Nam			
10	18-JUL-19	---OTHER ANIMAL	Animal Products	DRIED OMASSUM	20000	10108.72569	Viet Nam			
11	19-JUL-19	---OTHER ANIMAL	Animal Products	DRIED PENIS AND DRIE	20000	8794.588583	Viet Nam			
12	10-JUL-19	---Bee Wax	Bees Wax	CONVENTIONAL BEESW	12000	96869.3703	Germany			
13	17-JUL-19	---Bee Wax	Bees Wax	ETHIOPIAN BEESWAX N	5	45.4520336	Germany			
14	20-JUL-19	---teff	Cereals	ETHIOPIAN ORIGIN WHI	16100	18372.11953	United Kingdom			
15	20-JUL-19	---teff	Cereals	ETHIOPIAN ORIGIN TEF	2500	2913.790995	United Kingdom			
16	19-JUL-19	Millet	Cereals	FINGER MILLET	56000	22643.54001	Kenya			
17	20-JUL-19	--OTHER	Cereals	FINGER MILLET FLOUR	5000	10108.72569	United States			
18	30-JUL-19	Barley	Cereals	YETFEFETEFE GEB5 (CUI	1000	1062.35494	Saudi Arabia			
19	12-JUL-19	--OTHER	Chat	1ST GRADE CHAT	1369	11061.07708	Djibouti			
20	18-JUL-19	--OTHER	Chat	1ST GRADE CHAT	2375	19206.59262	Djibouti			
21	22-JUL-19	--OTHER	Chat	1ST GRADE CHAT	2500	20217.45137	Djibouti			
22	29-JUL-19	--OTHER	Chat	1ST GRADE CHAT	616	4986.04664	Djibouti			
23	30-JUL-19	--OTHER	Chat	1ST GRADE CHAT	255	2144.983698	Djibouti			

Export data from 2000-2012 e.c Manufacturing.xlsx										
	A	B	C	D	E	F	G	H	I	J
1	ASSDATE	HSDSC	CAT_COD	COMERCIALDSC	NWEIGHT	FOB_VALUE_IN CDESTINATION				
2	11-JUL-19	-OTHER	Finished Leather	COW ASA FINISHED LI	49	324.3465407 Viet Nam				
3	02-AUG-19	-OTHER	Finished Leather	COW ASA FINISHED LE	190	1840.047524 Viet Nam				
4	03-AUG-19	-OTHER	Finished Leather	COW ASA FINISHED LE	48	578.4082118 Viet Nam				
5	30-JUL-19	-OTHER	Finished Leather	COW LINING & COW A:	2404	30366.34477 Viet Nam				
6	22-JUL-19	-OTHER	Finished Leather	COW LINING & COW A:	1034	17056.00284 Viet Nam				
7	27-JUL-19	-OTHER	Finished Leather	COW LINING (FINISHE	1051	12680.94468 Hong Kong				
8	03-AUG-19	-OTHER	Finished Leather	COW LINING FINISHEI	182	1127.113727 Viet Nam				
9	18-JUL-19	-OTHER	Finished Leather	COW LINING& COW AS	2693	46901.83604 Viet Nam				
10	22-JUL-19	-OTHER	Finished Leather	COW LINING,COW OUT	497	6114.990882 Viet Nam				
11	05-AUG-19	LEATHER PREP/	Finished Leather	FINISHED GOAT LEAT	633	7978.075265 China				
12	30-JUL-19	LEATHER PREP/	Finished Leather	FINISHED SHEEP LEA	820	38259.56012 Cambodia				
13	06-AUG-19	--Other	Finished Leather	FINISHED COW LEATH	46	1262.813605 Viet Nam				
14	02-AUG-19	OTHER LEATHEI	Finished Leather	FINISHED COW LEATH	952.03	34240.54349 Viet Nam				
15	24-JUL-19	LEATHER PREP/	Finished Leather	FINISHED COW LEATH	13	225.9131852 Hong Kong				
16	13-JUL-19	-OTHER	Finished Leather	FINISHED COW LEATH	11558.9	84974.68363 China				
17	08-JUL-19	-OTHER	Finished Leather	FINISHED COW LEATH	347.11	5424.806715 Sweden				
18	08-JUL-19	OTHER LEATHEI	Finished Leather	FINISHED COW LEATH	80.6	2960.840794 China				
19	16-JUL-19	--other	Finished Leather	FINISHED COW LEATH	1423.24	39627.542 Viet Nam				
20	16-JUL-19	--other	Finished Leather	FINISHED GOAT LININ	9649.44	112260.3407 China				
21	16-JUL-19	LEATHER OF GO.	Finished Leather	FINISHED GOAT SUED	15.61	485.2937113 Viet Nam				
22	02-AUG-19	LEATHER OF GO.	Finished Leather	FINISHED GOAT SUED	119.64	4364.155062 Viet Nam				
23	19-JUL-19	LEATHER OF GO.	Finished Leather	FINISHED GOAT SUED	503.32	16286.40307 China				

The date was written date month and year then changed to the date to year only to make it suitable for the analysis. In addition, there was missed date and editing the date that do not have date and assign date accordingly. Some products category has spelling error because of the spelling error one item listed many times, and then edit the spelling error and listed the product correctly, since the software understands it as different products. Some products written in different name i.e. have different Product name, arranged it by giving one particular name. And different sheets come to one sheet.

### 3.4.1. Data Cleaning

Data cleaning is the process of fixing or removing incorrect, corrupted, incorrectly formatted, duplicate, or incomplete data within a dataset or is the process that removes data that does not belong in your dataset (Dilmegani 2021; (www.tableau.com)).

When combining multiple data sources, there are many opportunities for data to be duplicated or mislabeled. If data is incorrect, outcomes and algorithms are unreliable, even though they may look correct. There is no one absolute way to prescribe the exact steps in the data cleaning process because the processes will vary from dataset to dataset. However, the techniques used for data cleaning may vary according to the types of data stored, can follow these basic steps to map out a framework([www.tableau.com](http://www.tableau.com)).

According to many studies, the following are the typical data cleaning activities and or actions. And thus, these steps are followed in this study.

### **Remove duplicate or irrelevant observations**

Remove unwanted observations from the dataset, including duplicate observations or irrelevant observations. Duplicate observations will happen most often during data collection. When you combine data sets from multiple places, scrape data, or receive data from clients or multiple departments, there are opportunities to create duplicate data. De-duplication is one of the largest areas to be considered in this process.

Irrelevant observations are when you notice observations that do not fit into the specific problem you are trying to analyze. This can make analysis more efficient and minimize distraction from primary target as well as creating a more manageable and more performant dataset.

### **Fix structural errors**

Structural errors are when measure or transfer data and notice strange naming conventions, typos, or incorrect capitalization. These inconsistencies can cause mislabeled categories or classes.

### **Filter unwanted outliers**

Often, there will be one-off observations where, at a glance, they do not appear to fit within the data that are analyzing. If there is a legitimate reason to remove an outlier, like improper data-entry, doing so will help the performance of the data. However, sometimes it is the appearance of an outlier that will prove a theory that working on. Just because an outlier exists, doesn't mean it

is incorrect. This step is needed to determine the validity of that number. If an outlier proves to be irrelevant for analysis or is a mistake, consider removing it.

### **Handle missing data**

It can't ignore missing data because many algorithms will not accept missing values. There are a couple of ways to deal with missing data. Neither is optimal, but both can be considered. As a first option, drop observations that have missing values, but doing this will drop or lose information, so need to be mindful of this before remove it.

As a second option, can input missing values based on other observations; again, there is an opportunity to lose integrity of the data because may be operating from assumptions and not actual observations. As a third option, might alter the way the data is used to effectively navigate null values.

### **Validate and QA (Quality Assurance)**

Then the data is evaluated for its quality with respect to its: Does the data make sense? Does the data follow the appropriate rules for its field? Does it prove or disprove the working theory, or bring any insight to light? If not, is that because of a data quality issue; incorrect or "dirty" data leads to false conclusion and poor decision-making. It is important to create a culture of quality data.

### **Benefits of data cleaning**

Having clean data will ultimately increase overall productivity and allow for the highest quality information in decision-making. Some of the benefits include; removal of errors when multiple sources of data are at play, ability to map the different functions and what the data is intended to do, Monitoring errors and better reporting to see where errors are coming from, making it easier to fix incorrect or corrupt data for future applications and using tools for data cleaning will make for more efficient business practices and quicker decision-making([www.tableau.com](http://www.tableau.com)).

### **Data cleaning tools and software**

Software like Tableau Prep can help drive a quality data culture by providing visual and direct ways to combine and clean the data. Tableau Prep has two products: Tableau Prep Builder for building the data flows and Tableau Prep Conductor for scheduling, monitoring, and managing flows across the organization. Using a data scrubbing tool can save a database administrator a significant amount of time by helping analysts or administrators start their analyses faster and have more confidence in the data. Understanding data quality and the tools that need to create, manage, and transform data is an important step toward making efficient and effective business decisions([www.tableau.com](http://www.tableau.com)).

### 3.4.2 Transforming Data

Data transformation is the process of changing the format, structure or values of data. Data transformation can increase the efficiency of analytic and business process and enable better data-driven decision making (Manikandan, 2010).

Transforming data has some benefits; transformed data is easier for both humans and computers, data transformation facilitates compatibility between applications, systems, and types of data and also properly formatted and validated data improves data quality and protects applications from potential landmines such as null values, unexpected duplicates, incorrect indexing, and incompatible formats (Daja, 2020).

During transformation some steps are taken to convert it into the desired format;

**Data discovery** is identifying and understanding the data in its source format. It helps to decide what needs to happen to the data in order to get it into the desired format.

**Data mapping** at this step the actual transformation process is planned

**Generating code**, a code must be created to run the transformation job, these codes are generated with the help of a data transformation platform.

**Executing the code**, the data transformation process that has been planned and coded is now put into motion, and the data is converted to the desired output.

**Review** transformed data is checked to make sure it has been formatted correctly.

After applied all the data cleaning and transformation process the data comes to the desired format and looks like shown on the figure below;

DATE/YEAR	CATEGORY	COMMERCIAL DESC	DEST/COUNTRY	NETWEIGHT (KG)	FOB Value (USD)
2007	TEXTILE AND GARMENT	Textile and Garment	ISRAEL	282.40	1023.96
2007	TEXTILE AND GARMENT	Textile and Garment	UNITED STATES OF AME	40.00	125.00
2007	TEXTILE AND GARMENT	LEATHER SHOES UPPERS	UNITED STATES OF AME	16.00	43.00
2007	Textile and Garment	LEATHER SHOES UPPERS	UNITED STATES OF AME	0.00	63.00
2007	TEXTILE AND GARMENT	LEATHER SHOE UPPERS OR PAIR	UNITED STATES OF AME	100	267
2007	TEXTILE AND GARMENT	Clothes	FRANCE	6.00	163.00
2007	TEXTILE AND GARMENT	DIFFERENT FOOD	FRANCE	14.00	63.00
2007	TEXTILE AND GARMENT	CRUET	FRANCE	14.00	103.00
2007	TEXTILE AND GARMENT	FINISHED LEATHER	FRANCE	19.00	7.50
2007	FINISHED LEATHER	LEATHER ARTICLE	FRANCE	6	51
2007	TEXTILE AND GARMENT	CRUST	ISRAEL	190	313
2007	TEXTILE AND GARMENT	CRUST	DIRECT	16	15
2007	TEXTILE AND GARMENT	SHOE	DIRECT	40	175
2007	TEXTILE AND GARMENT	Clothes	ITALY	7,196.63	11057.17
2007	TEXTILE AND GARMENT	Clothes	ITALY	7,300	12,161
2007	TEXTILE AND GARMENT	SHOE	ITALY	7,420.00	14855.40
2007	TEXTILE AND GARMENT	SHOE	ITALY	7,000.00	11517.96
2007	TEXTILE AND GARMENT	SHOE	ITALY	2,928.00	4,343.31
2007	TEXTILE AND GARMENT	SHOE	ITALY	5,089.40	8,653.43
2007	TEXTILE AND GARMENT	SHOE	ITALY	7,130.00	14753.30
2007	TEXTILE AND GARMENT	SHOE	ITALY	7,130.00	14411.70
2007	TEXTILE AND GARMENT	SHOE	UNITED KINGDOM	57.70	9262.24
2007	TEXTILE AND GARMENT	SHOE	UNITED KINGDOM	2,176.00	7,015.00

AgriSource 2018 - 2022 (7 of 8) - Microsoft Excel

AgriSource 2018 - 2022 (7 of 8) - Microsoft Excel

AgriSource 2018 - 2022 (7 of 8) - Microsoft Excel

DATE/YEAR	CATEGORY	COMMERCIAL DESC	DEBT COUNTRY	NET WEIGHT (KG)	FOB VALUE (USD)
2018	Flower	CUT FLOWERS	NETHERLANDS	213.36	4627.9
2018	Flower	CUT FLOWERS	NETHERLANDS	239.36	4877.6
2018	Flower	CUT FLOWERS	NETHERLANDS	196.36	4233.1
2018	Flower	CUT FLOWERS	NETHERLANDS	196.36	5033.0
2018	Flower	CUT FLOWERS	NETHERLANDS	211.36	3813.0
2018	Flower	CUT FLOWERS	NETHERLANDS	416.36	7813.9
2018	Flower	CUT FLOWERS	NETHERLANDS	476.36	3913.0
2018	Flower	CUT FLOWERS	NETHERLANDS	713.36	1213.1
2018	Flower	CUT FLOWERS	NETHERLANDS	638.36	3013.1
2018	Flower	CUT FLOWERS	NETHERLANDS	436.36	323.1
2018	Flower	CUT FLOWERS	NETHERLANDS	1158.36	2133.5
2018	Flower	CUT FLOWERS	NETHERLANDS	112.36	1233.3
2018	Flower	CUT FLOWERS	NETHERLANDS	128.36	2813.5
2018	Flower	CUT FLOWERS	NETHERLANDS	241.36	1463.1
2018	Flower	CUT FLOWERS	NETHERLANDS	633.3	12813.5
2018	Flower	CUT FLOWERS	NETHERLANDS	503.3	13813.6
2018	Flower	CUT FLOWERS	NETHERLANDS	463.3	17513.4
2018	Flower	CUT FLOWERS	NETHERLANDS	343.3	3131.6
2018	Flower	CUT FLOWERS	NETHERLANDS	1613.3	4213.6
2018	Flower	CUT FLOWERS	NETHERLANDS	743.3	1261.2
2018	Flower	CUT FLOWERS	NETHERLANDS	373.3	1384.6
2018	Flower	CUT FLOWERS	NETHERLANDS	703.3	1303.6
2018	Flower	CUT FLOWERS	NETHERLANDS	633.3	3463.1

AgriSource 2018 - 2022 (7 of 8) - Microsoft Excel

AgriSource 2018 - 2022 (7 of 8) - Microsoft Excel

AgriSource 2018 - 2022 (7 of 8) - Microsoft Excel

DATE/YEAR	CATEGORY	COMMERCIAL DESC	DEBT COUNTRY	NET WEIGHT (KG)	FOB VALUE (USD)
2014	Other Mineral Products	1ST PRICE ROUGH CRN	Algeria	0	1150.00
2013	Oil Seed	ETHIOPIAN WHITE SESAME SEEDS HUMANITY	Algeria	15,300.00	30,300.00
2014	Pulse	WHITE PEABEANS	Algeria	6,300	12,480
2014	Oil Seed	SESAME SEEDS	Algeria	15,300	30,300.00
2013	Pulse	WHITE PEABEANS	Algeria	15,300.00	14,580.00
2013	Pulse	WHITE PEABEANS	Algeria	2,310.00	4,320.00
2012	Pulse	WHITE PEABEANS	Algeria	12,300.00	9,360.00
2013	Pulse	WHITE PEABEANS	Algeria	13,300.00	3,360.00
2013	Oil Seed	ETHIOPIAN WHITE SESAME SEEDS HUMANITY	Algeria	21,300.00	36,300.00
2013	Oil Seed	ETHIOPIAN SESAME SEEDS HUMANITY	Algeria	31,300.00	11,424.00
2010	Oil Seed	ETHIOPIAN SESAME SEEDS HUMANITY	Algeria	26,300.00	27,000.00
2013	Pulse	WHITE PEABEANS	Algeria	13,300.00	13,116.00
2010	Spice	BLACK CARAWAY SEEDS	Algeria	15,000.00	32,500.00
2013	Pulse	ETHIOPIAN WHITE PEABEANS	Algeria	13,000.00	12,288.00
2013	Pulse	WHITE PEABEANS	Algeria	13,000.00	27.00
2010	Oil Seed	SESAME SEEDS	Algeria	15,000.00	15,500.00
2010	Oil Seed	ETHIOPIAN WHITE SESAME SEEDS HUMANITY	Algeria	15,000	22,500
2013	Oil Seed	ETHIOPIAN WHITE SESAME SEEDS HUMANITY	Algeria	13,000	27,500
2013	Oil Seed	SESAME SEEDS	Algeria	11,400	20,100
2014	Oil Seed	ETHIOPIAN WHITE SESAME SEEDS HUMANITY	Algeria	15,000	22,500.00
2014	Oil Seed	ETHIOPIAN WHITE SESAME SEEDS HUMANITY	Algeria	15,000	22,500.00



systems. These tools help prepare data for analysis so that can create reports, dashboards and data visualizations. Business intelligence tools help to understand trends and deriving insights from the data that able to make tactical and strategic business decision(Haije, 2019).Tableau and Power BI are the two most common data visualization tools.

### 3.6. Tableau

Tableau is a data analysis and visualization tool which can connect with many data sources comfortably (Akhtaret al., 2020). Tableau was founded in 2003 at Stanford aimed to improve the flow of analysis and make data more accessible to people through visualization.

#### **Tableau products**

##### **Tableau Public**

Tableau Publicis data visualization software package with multiple interactive features. CanutilizeTableau Public with a number of different data sources, including Microsoft Excel, spatial and text files. There are a wide variety of charts available, including standard bar, line and pie charts, heat maps, highlight tables and tree maps. Tableau Public is free, no expert knowledge needed to create data visualizations and allows for rapid large-scale analysis and can make sense of huge and complex data sources (Datig & Whiting,2018).

##### **Tableau Desktop**

Tableau desktop is a paid application with fourteen days trial, can easily import data into tableau's data engine from multiple sources and integrate them by combining multiple views in an interactive dashboard. It produces files with extensions twb (tableau workbook file) and twbx (tableau packaged workbook) (Hamersky,2016; Akhtar et al.,2020).

##### **Tableau Server**

Tableau server is a paid server application that needs to be installed on a window; it is used widely in the enterprise world. There would be a dedicated admin to supervise the memory, usermanagement, data source management and folder management (Chabotet al., 2003).

## **Tableau Reader**

Tableau reader is a free desktop application to view tableau dashboards and interacts with tableau visualizations. Users can view dashboards twbx (tableau packaged workbook), interact with them i.e. filter and drill down data but cannot edit the formula or charts (Chabot et al., 2003; Akhtar et al., 2020).

## **Tableau Online**

Tableau online is hosted by tableau software no need to install on any windows server, it helps to access tableau dashboards from anywhere (Chabot et al., 2003). Tableau Online is a fully hosted solution, organizations don't have to spend resources on configuring hardware, scalability or maintenance and it is highly secured for data visualizing (Akhtar et al., 2020).

## **3.7 Power BI**

Power BI is a suite of business intelligence (BI), reporting, and data visualization products and services for individuals and teams. It stands out with streamlined publication and distribution capabilities, as well as integration with other Microsoft products and services. It is a collection of software services, apps, and connectors that work together to turn unrelated sources of data into coherent, visually immersive, and interactive insights. The data may be an Excel spreadsheet, or a collection of cloud-based and on-premises hybrid data warehouses. Power BI can easily connect to the data sources, visualize and discover what's important, and share that with anyone (Power, 2020).

Power BI, is a business analytics solution that helps to visualize the data and share insights across the organization. The solution comprises several products and services, and value and versatility comes from leveraging the individual elements, and taking advantage of how they work together (Ferrari & Russo, 2016).

Power BI has three basic elements that all work together

**Power BI Desktop** a Windows desktop application it is a free, self-service data analysis and report authoring tool that you install on a Windows computer. It can connect to more than 70 on-

premises and cloud data sources to turn information into interactive visuals. Data scientists and developers work with Power BI Desktop to produce reports and make them available to the Power BI service.

**Power BI service** an online Software as a Service, Power BI service is a secure Microsoft hosted cloud service that lets users view dashboards, reports, and Power BI apps a type of content that combines related dashboards and reports using a web browser or via mobile apps for Windows, iOS, and Android.

**Power BI mobile apps** for Windows, iOS, and Android devices.

## CHAPTER FOUR

### Results and Discussion

#### 4.1. Introduction

The export data is analyzed in two groups the First group is manufacturing products categorized as animal vaccine, Capsule, crust, Finished Leather, hair oil, Leather product, shoes, Tyre, Textile and garment and other. And the second group agricultural commodities and Mineral Products categorized as ; coffee, coffee processed,Pulse,Spice,spice processed, oil seed ,oilseed processed,cereals,fruits & vegetables,fruit processed,food&flour,Chat ,Flower,cotton,Eucalyptus, natural honey, bees wax, natural gum ,meat and meat products, milk and milk products,gold,tantalite ore and other mineral products.

Uploaded excel files into Tableau software and visualized each category.

#### 4.2. Data Visualization and Analytics using Tableau



Figure 1 category and destination

As Figure 1 shows that, the visualization clearly indicates that the category of products (Animal vaccine, capsule, crust, Finished Leather, Hair oil, Leather product, other, shoes, Textile and Garment and Tyre) export destinations. Some products export concentrated on some areas. For instance Animal Vaccine and Capsule are mostly exported to African countries, few Asian countries and only to one South American country hence there are many potential markets in other continents and countries as well, need to access these new markets.

The leather industry is one of the prioritized industries for the diversification of export and foreign exchange earnings (Ministry of Finance and Economic Development, 2010 and National Planning Commission, 2016) and Ethiopia possesses one of the world's largest livestock populations. Ethiopia with 56.7 million cattle, 29.1 million sheep, and 29.3 million goats is eighth, twelfth and eighth place from the world respectively with the share of 2.75 percent from the world total (FAO, 2017). Also textile and garment is among the priority subsectors identified by the Ethiopian government in transforming the country's traditional agricultural based economic activity to industrialization.

In recent years, due to various opportunities, the global market has become increasingly accessible to countries such as Ethiopia. New export opportunities were created through initiatives such as AGOA (the African Growth and Opportunity Act), COMESA (the Common Market of Eastern and Southern Africa), "Everything But Arms" program that has been set up to provide access to the E.U. market for Lesser Developed Beneficiary Countries, free of duty and without quota restrictions and also the newly launched AfCFTA (African continental Free Trade Area).

There for need to give more emphasis to use these opportunities and access untouched market by finding new export partners, the country should work to promote the export of its product in all over the world.

Each category destinations described as;

**Animal vaccine** mostly exports to African countries such as South Africa ,Zimbabwe, Zambia, Angola, Comoros (island), Congo, Democratic Republic of Congo, Burundi, Central African republic, Tanzania, Kenya, Somalia, Sudan, south Sudan ,Djibouti, Chad ,Niger, Nigeria, Ghana,

Burkina Faso, Cote d' Ivoire, Guinea, Liberia, Gambia, Senegal and Mali. Asian countries exports to Lebanon and Oman. Europe to Germany.South America exports to Colombia.

**Capsule** also mostly exports to African countries particularly to East African countries; Kenya, Uganda, Rwanda, Somalia, Malawi, and the other African countries are Sudan, Ghana, Congo, Zimbabwe and south Africa.

To Asia, Middle Eastcountries; SaudiArabia and Yemen.South Asia to India.And South America country Colombia.

**Crust**exports to America United states; European countries; Italy Romania and United Kingdom, Portugal, Spain, France,Switzerland,Netherland, Czech Republic,Slovakia,Sweden,Greece,and Russia.Asian countries;China, HongKong, SouthKorea, Japan, Viet Nam, Thailand, Malaysia, Indonesia and Sri Lanka, Turkey and United Arab Emirates; AfricanCountries; Tunisia.

**Finished Leather** exports to North America; United states of America, Canada,Haiti,United states Virgin Islands. South America; Colombia, Venezuela, Peru, Brazil and Paraguay.

European countries; Sweden,Finland,Norway,United Kingdom,Belgium,Netherlands,Germany, Austria, Czech, Republic, Poland, Slovakia, Belarus, Ukraine, Romania, Hungary, Albania, Greece, Italy, France, Andorra, Portugal, Spain and Russia.

Asian Countries Turkey, Israel, Armenia, Saudi Arabia, United Arab Emirates, Yemen, Pakistan, India, Bangladesh, Myanmar, Thailand, Lao people's Democratic Republic, Hongkong, Philippines, Cambodia, Singapore, Indonesia, Siri lanka, China, Japan, South Korea.

African countries; South Africa, Zimbabwe, Malawi, Tanzania, Kenya, Rwanda, South Sudan, Sudan, Djibouti, Congo, Democratic Republic of Congo,Nigeria, Ghana, Cote d'Ivoire and Sierra Leone.

**Hair Oil** exports to North America,Canada and,United States;African Countries South Africa,Swazi land, Rwanda, Somalia, South Sudan, Sudan and Djibouti;Asia Yemen, Saudi Arabia, United Arab Emirates, Israel and Lebanon; European Countries Greece, Switzer land, Belgium, Germany, United Kingdom, Norway and Sweden, Australia and New Zealand.

**Leather products** export to North America; United States of America, Canada, Bermuda, Bahamas and Panama, South America; Brazil.

European countries; Sweden, Finland, Norway, Denmark, United Kingdom, Belgium, Austria, Croatia, Czech Republic, Poland, Romania, Hungary, Greece, Italy, France, Portugal, Spain and Russia.

Asian Countries Turkey, Israel, Jordan, Saudi Arabia, United Arab Emirates, Yemen, India, Thailand, Hong Kong, Singapore, Indonesia, China, Japan, South Korea.

To Australia and New Zealand.

African countries; South Africa, Zimbabwe, Zambia, Botswana, Madagascar, Mali, Brundi, Tanzania, Kenya, Rwanda, Uganda, South Sudan, Sudan, Djibouti, Somali, Congo, Democratic Republic of Congo, Guinea, Nigeria, Niger, Ghana, Angola, Morocco

**Other Products** export to Djibouti, France, Italy, Oman, Tanzania and USA

**Shoes** Export to North America; United states of America, Canada, Mexico, Bermuda and Barbados, South America; Brazil, Chile and Colombia European countries; Sweden, Finland, Norway, Latvia, Denmark, Ireland, Belgium, Austria, Czech Republic, Poland, Bulgaria, Cyprus, Malta, Romania, Greece, Italy, Portugal, Spain and Russia. Asian Countries Turkey, Israel, Kuwait, Qatar, Oman, Saudi Arabia, United Arab Emirates, Yemen, India, Thailand, Malaysia, Hong Kong, Singapore, China, Japan, South Korea. Australia and New Zealand.

African countries; South Africa, Botswana, Swaziland, Angola, Malawi, Kenya, Rwanda, South Sudan, Sudan, Djibouti, Somali, Ghana, Morocco and Tunisia.

**Textile and Garment** export to North America; United states of America, Canada, Mexico, Guatemala, Honduras, Panama, Bahamas, Turks and Caicos Islands, Haiti, Saint Vincent and the Grenadines, United. South America; Colombia, Peru, Brazil Chile and Uruguay.

European countries; Sweden, Finland, Norway, Estonia, Ireland, United Kingdom, Belgium, Austria, Czech Republic, Poland, Latvia, Ukraine, Romania, Bulgaria, Hungary, Slovakia, Slovenia, Cyprus, Croatia, Albania, Greece, Italy, France, Germany, Georgia, Netherlands, Andorra, Portugal, Spain and Russia.

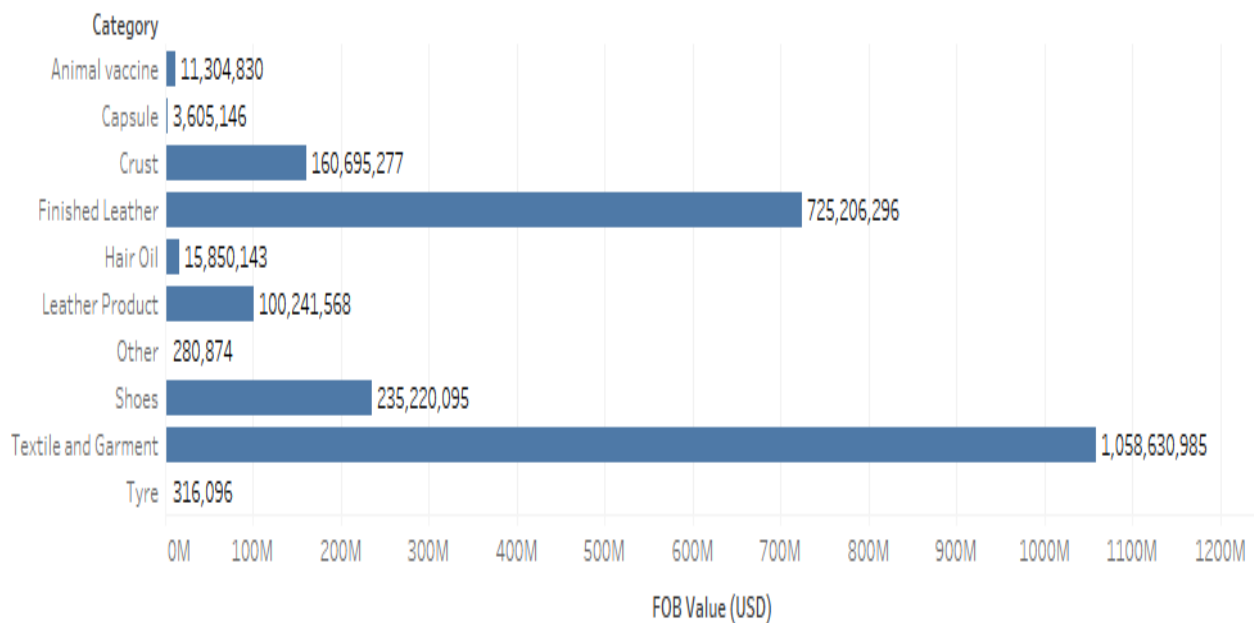
Asian Countries; Turkey, Israel, Armenia, Saudi Arabia, Syria, Kuwait, Bahrain, Iran, Afghanistan, United Arab Emirates, Yemen, Pakistan, India, Bangladesh, Myanmar, Thailand, Hong Kong, Cambodia, Singapore, Indonesia, Sri Lanka, Viet Nam, China, Japan, South Korea. Australia and New Zealand.

African countries; South Africa, Botswana, Swaziland, Angola, Mali, Mauritius, Comoros, Madagascar, Seychelles, Tanzania, Kenya, Rwanda, South Sudan, Sudan, Egypt, Djibouti, Congo, Democratic Republic of Congo, Central Africa Republic, Cameroon, Senegal, Nigeria, Niger, Ghana, Guinea, Sierra Leone, Algeria and Tunisia.

**Tyre** exports only to two continents Africa and Europe, mostly to Africa

African countries; Burundi, Sudan and Egypt; and European countries only to Slovakia.

Which category is the highest export in Value



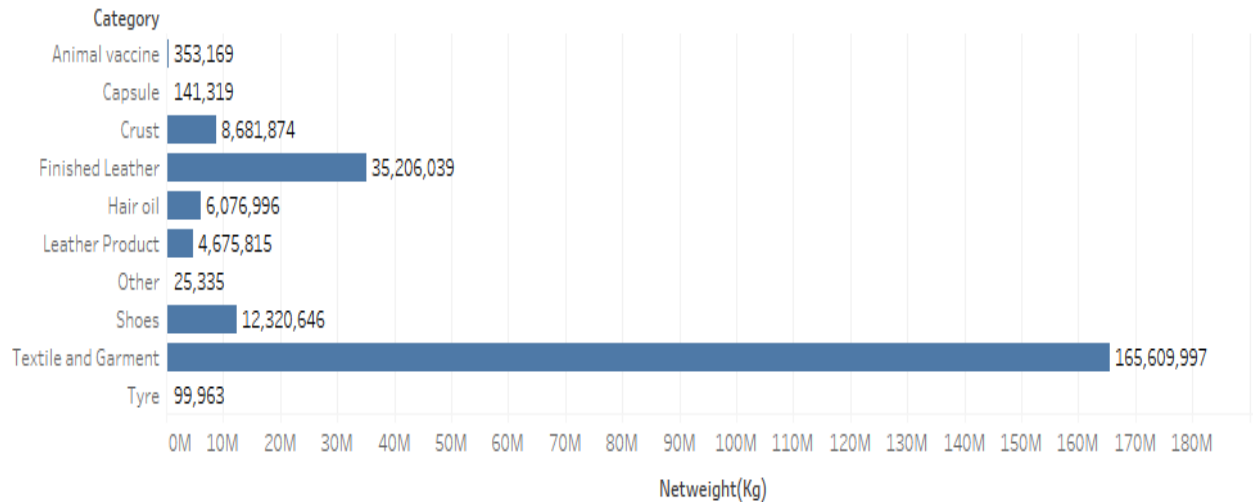
Sum of FOB Value (USD) for each Category.

Figure 2. Category of Products and related values of export

Figure 1 shows that from the product category the highest export is Textile and garment and the lowest export is tyre. And finished leather the second major export next shoes, crust and leather products consecutively, the rest category has not that much significant export returns.

Need more attention for the categories which bring high export income and why the rest of the products are insignificant.

Which category is the highest in weight



Sum of Netweight(Kg) for each Category.

Figure 3 Category and weight of the exported category of products

Based on Figure 3 the maximum export in weight from the above category Textile and Garment has the highest weight and products categorized as other shows the least volume.

Next to textile and garment the other category ranked as finished leather, shoes, crust, hair oil and leather products the remaining category animal vaccine, tyre and capsule are low in volume.

Low volume products minimize exporting costs such as; production, transport, and ware house

Increasing these types of products have great effect on export earnings.

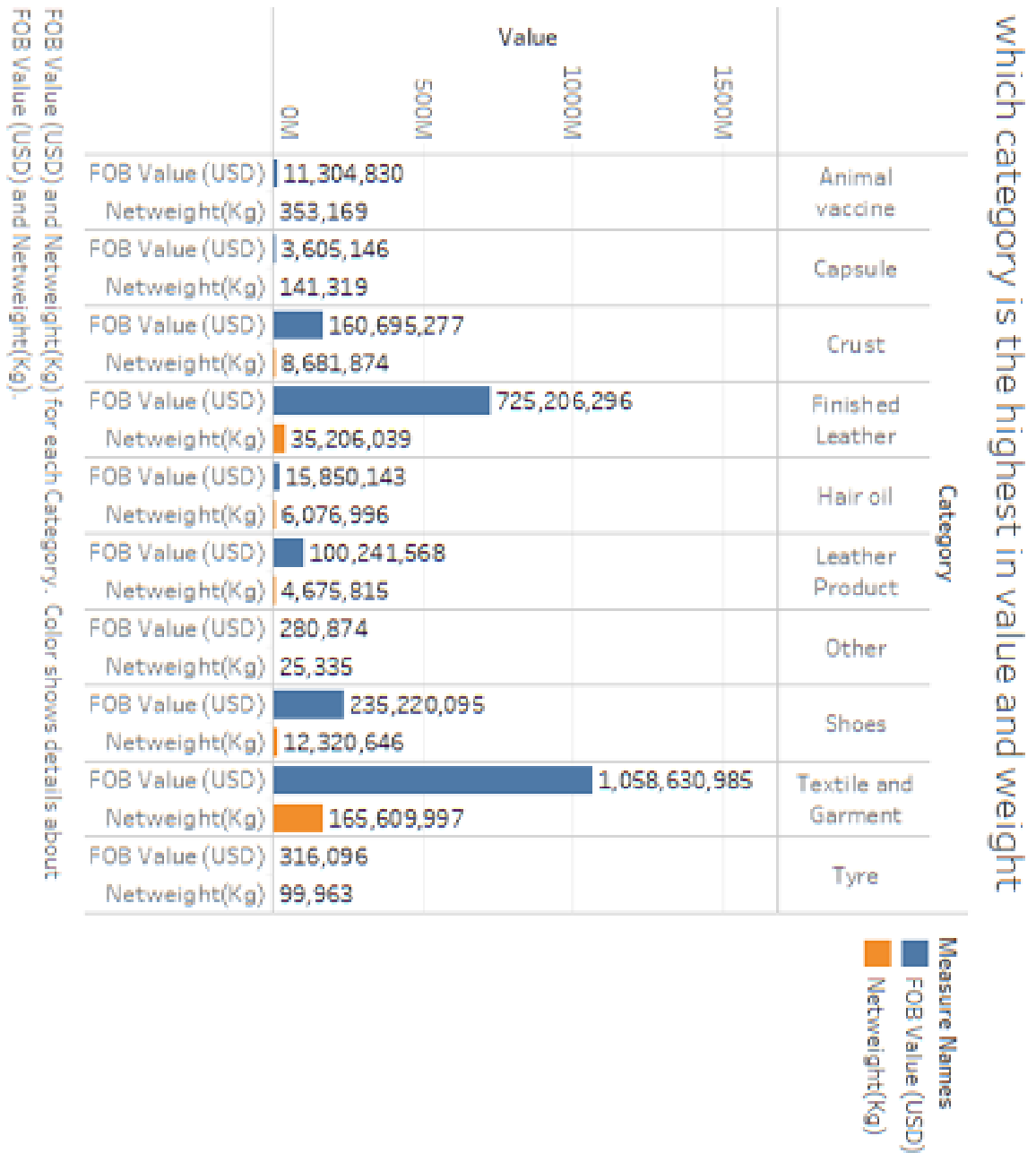


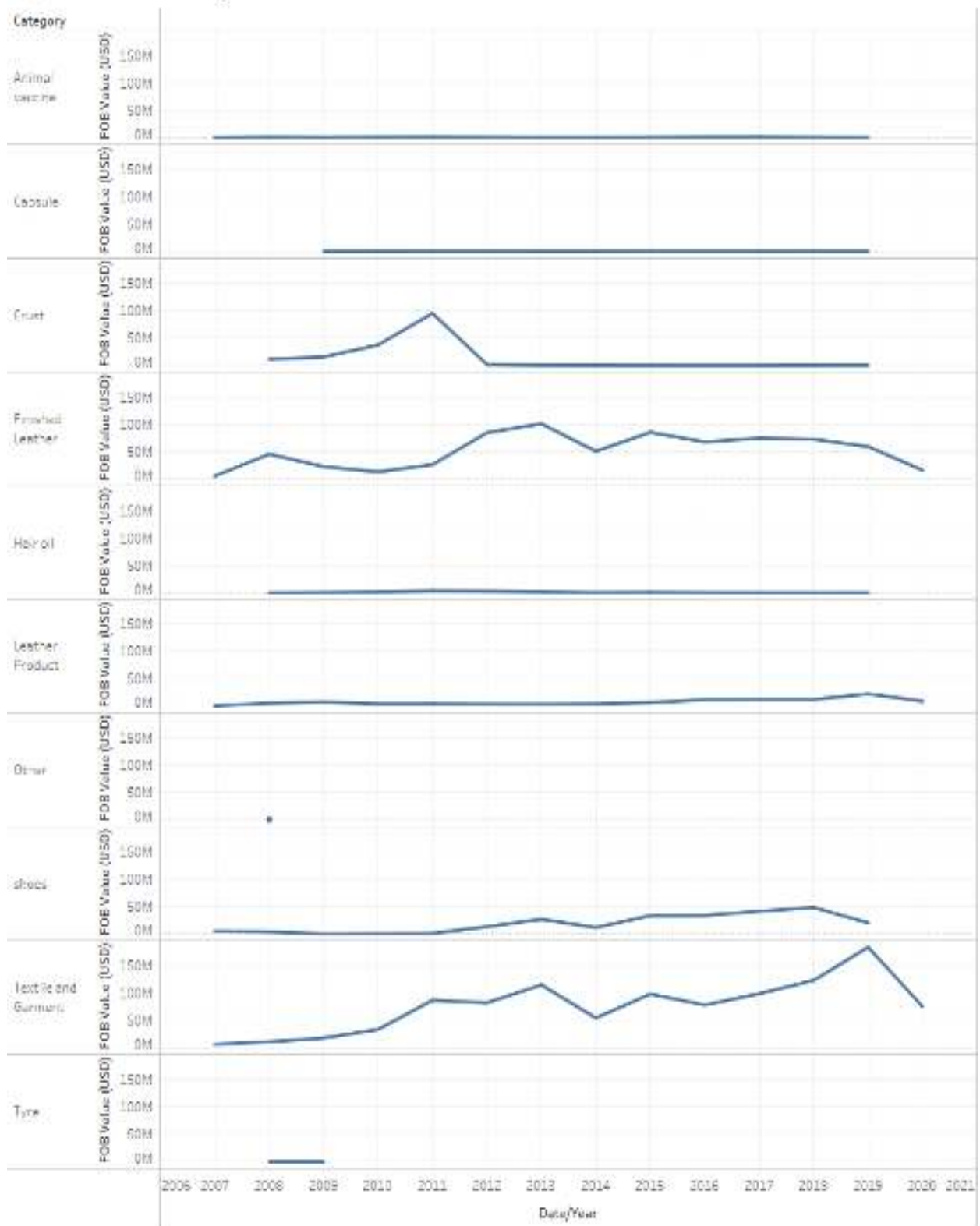
Figure 4 category, value and weight

According to figure 4 Textile and Garment is the highest export in both value and weight and Other is the lowest export in value and weight. When the volume or weigh of products are high

the related exporting cost (transportation, ware house) also high, these affect the revenue that generated by exporting those type of products.

In the case of animal vaccine and capsule both are high in value that means the value of export of this categories are greater than the volume of export, this indicate that products that do not take more space can be transported easily and that minimized transport and warehouse cost. Exporting more amounts of these type of products minimizes exporting cost and increase export income.

### Export trend over the years



The trend of sum of FOB Value (USD) for Date/Year broken down by Category.

Figure 5 category, value and year

As figure 5 shows some major product categories such as textile and garment, finished leather and leather product are exported all over the years. And their highest export/pick points were for Textile and garment in 2019; Finished leather in 2013; leather products in 2019.

**Animal vaccine** in the beginning shows increment for some years and then starts decline again increased reach its peak then decline.

**Capsule** in some years increased then decline and increased again decline then increased and decline.

**Crust** continuously increased and reaches its peak in 2011, then started decline and no export in the middle then exported again zero export and exported the next year, there was discontinuity

**Finished Leather** goes higher and higher reaches the highest point then the next year decline by half ,again up shows little increment and down then up and starts decline continuously.

**Hair oil** shows same patterns like Capsule.

**Leather products** in the beginning shows increment then down again continuously increased and reached its peak after that declined.

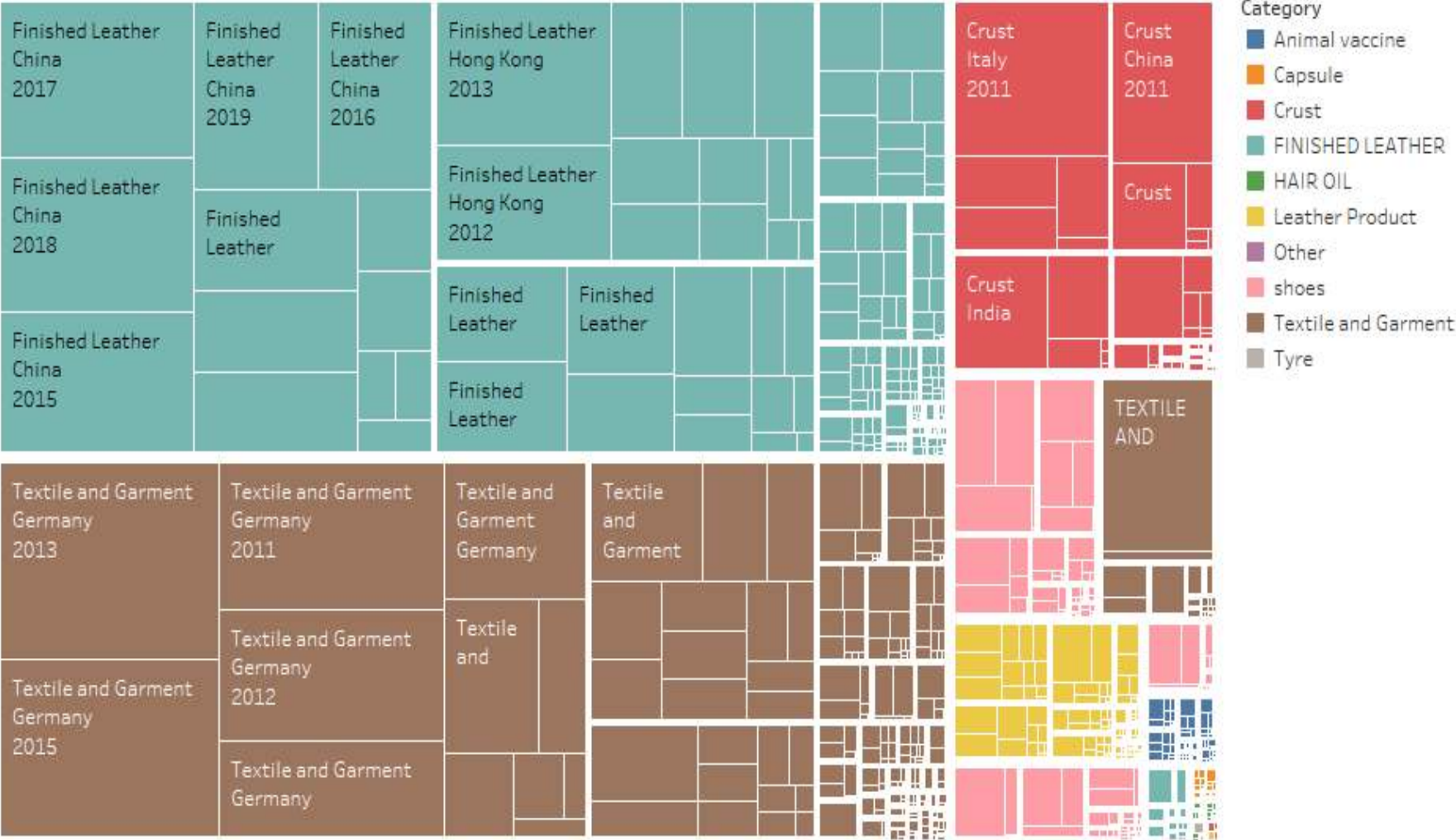
The products categorized under other are exported only in one year

**Shoes** initially for few years it declined then increased for some years and decreased then again increases continuously for number of years reaches its peak in 2018; and declined the next year then after that not exported or zero export

**Textile and Garment** increased for few years and down then up again down, up and down then after consecutively increased for few years reached the highest point next highly declined.

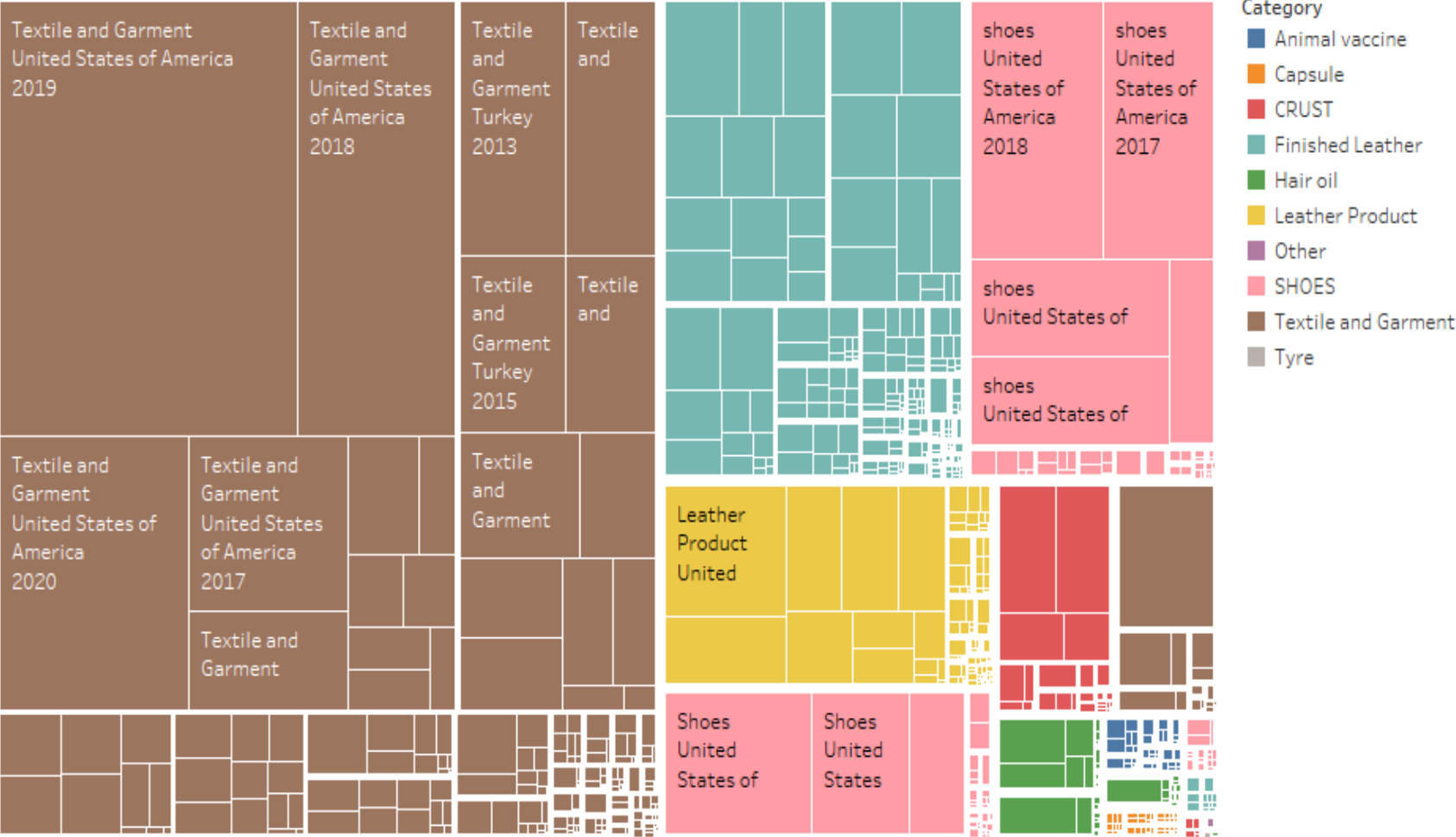
**Tyre** exports for two years the first year export was higher than the second year is lower than the previous.

# Highest export to which country(A-M) in which year



Category, Dest/Country and Date/Year. Color shows details about Category. Size shows sum of FOB Value (USD). The marks are labeled by Category, Dest/Country and Date/Year. The view is filtered on Dest/Country, which has multiple members selected.

# Highest export to which country(N-Z) in which year



Category, Dest/Country and Date/Year. Color shows details about Category. Size shows sum of FOB Value (USD). The marks are labeled by Category, Dest/Country and Date/Year. The view is filtered on Dest/Country, which keeps 56 members.

Figure 6 Destination and year

As figure 6 depicts export was performed throughout those years to the following Countries; China, Hong Kong, Italy, Germany, United States of America, Turkey.

**Textile & Garment** –Germany, Turkey, United States, Italy

**Finished Leather** –China, Hong Kong, Italy

**Leather Products**-United states

In 2020 during COVID the following products are exported to these countries;

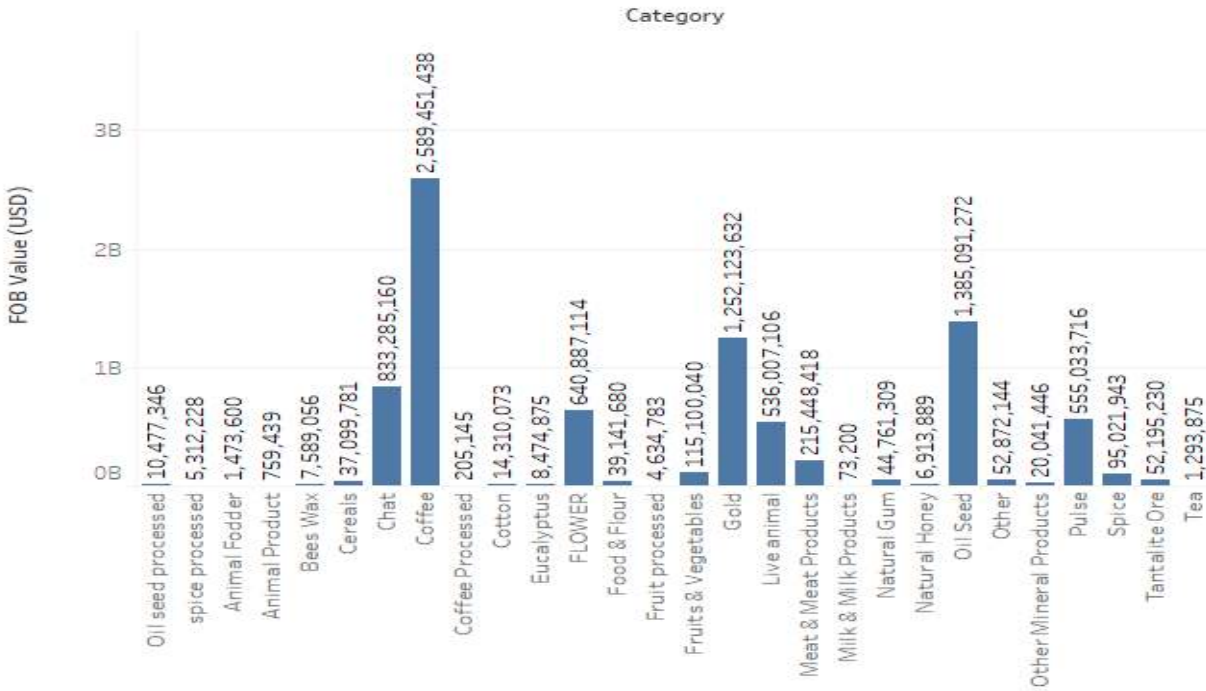
**Finished Leather**-China, Hong Kong, India, Sweden, Nigeria, Thailand, Indonesia, United Kingdom

**Textile & Garment**-Germany, Italy, China, Canada, Bangladesh, Croatia, United states, Malaysia, United Arab Emirates, Turkey, Spain, United Kingdom,

**Leather Products**-United States, Madagascar,

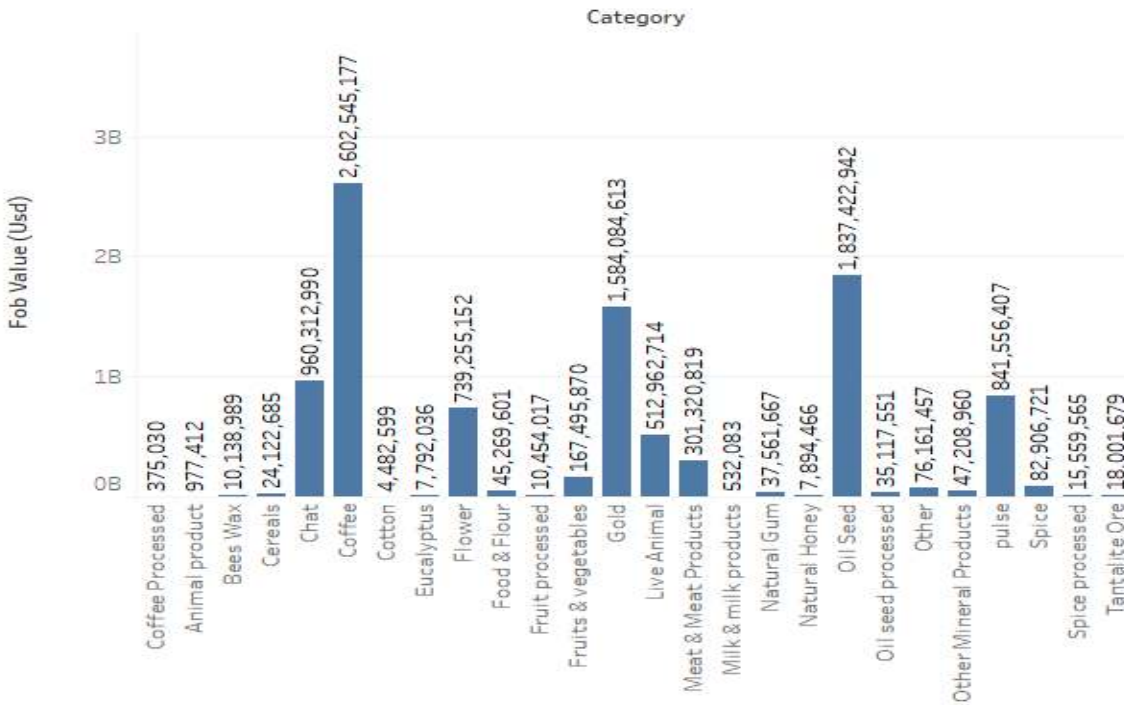
## Agricultural and mineral Products

Which category is the highest export in value



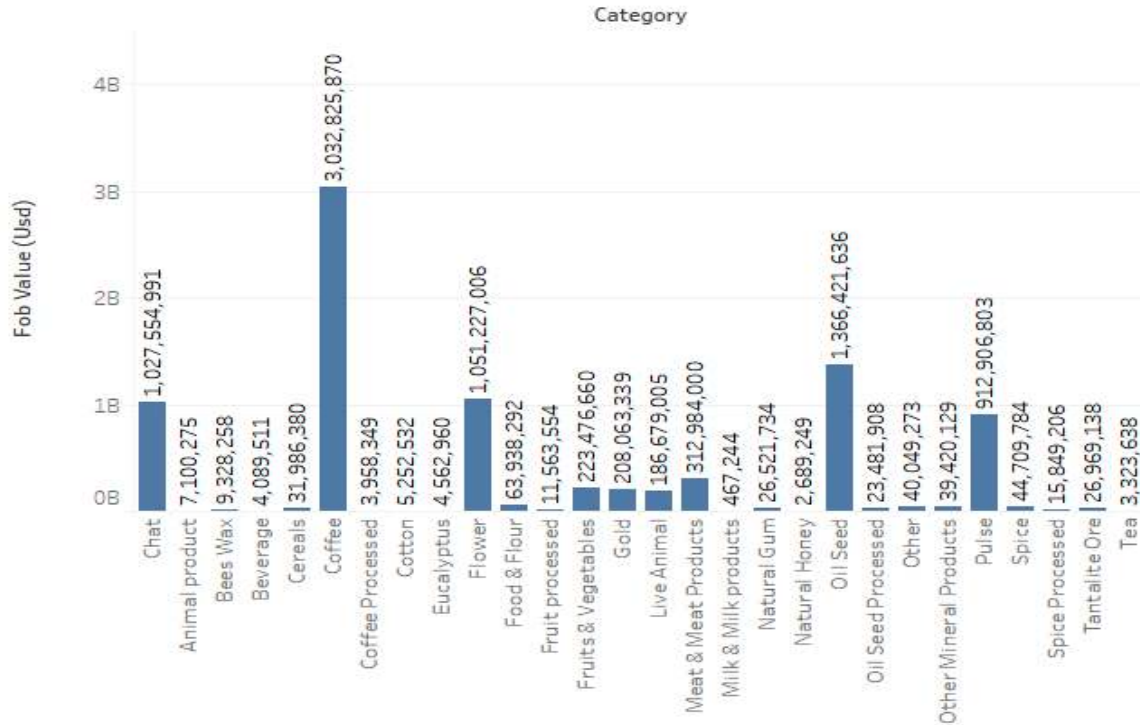
Sum of FOB Value (USD) for each Category.

Which category is the highest export in value



Sum of Fob Value (Usd) for each Category.

Which category is the highest export in value

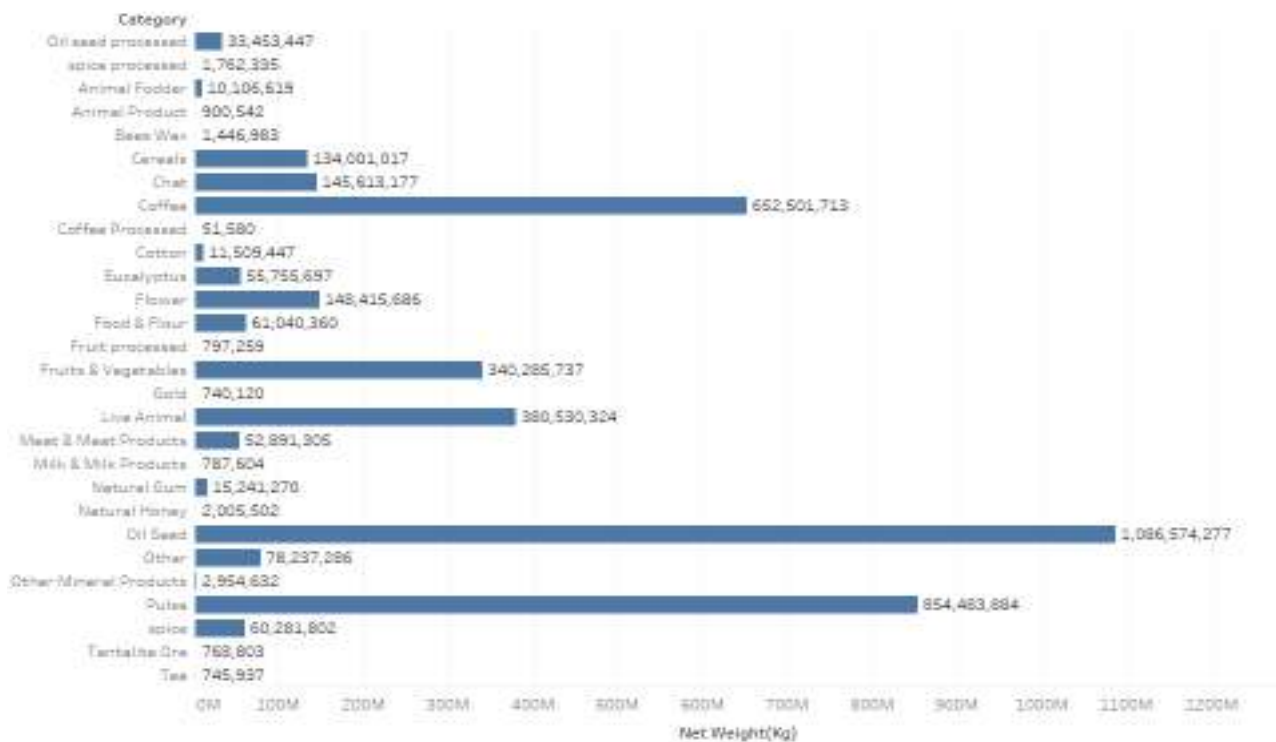


Sum of Fob Value (Usd) for each Category.

Figure 7 category and value

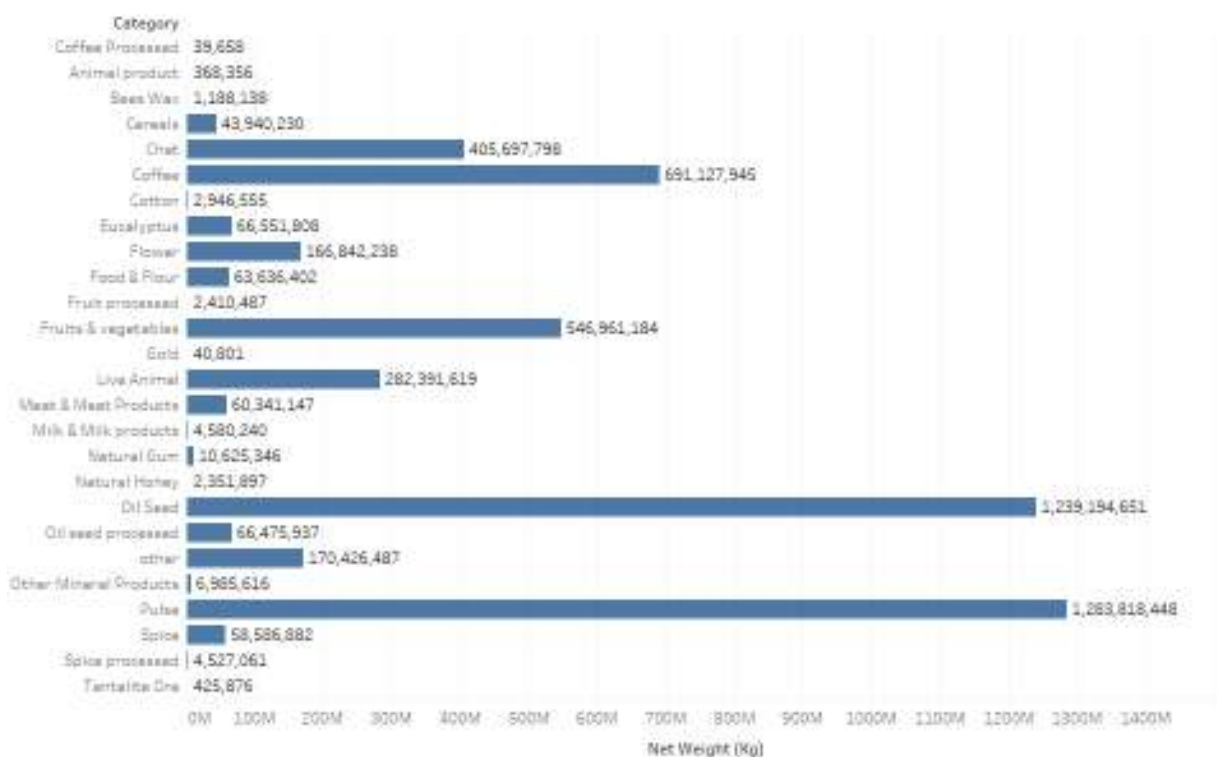
As figure 7 shows that the major or the highest export in value is coffee the next is oil seed and the third Gold. The least export among these categories is Milk and milk products.

Which category is the highest export in weight



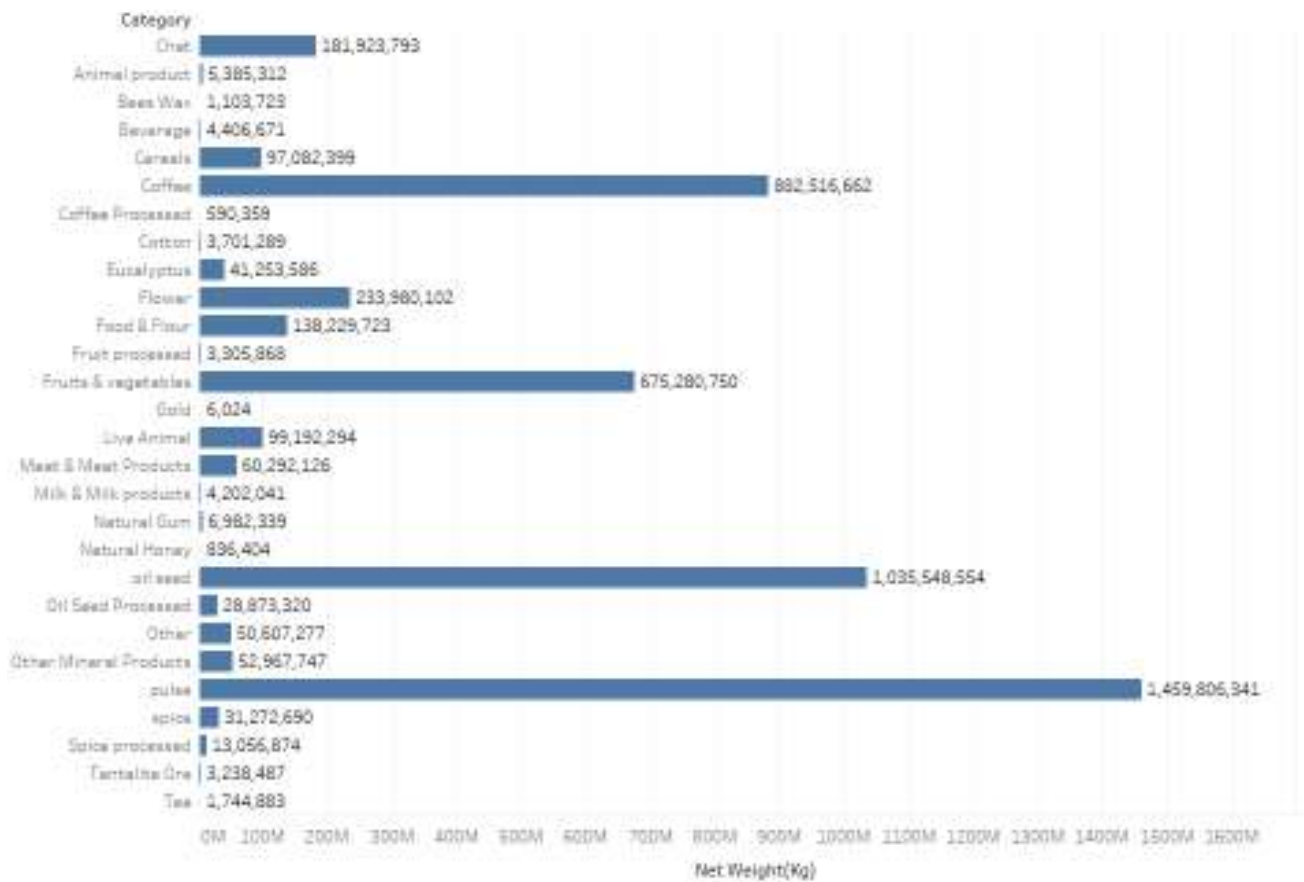
Sum of Net Weight(Kg) for each Category

Which category is the highest export in weight



Sum of Net Weight (Kg) for each Category

which category is the highest export in weight

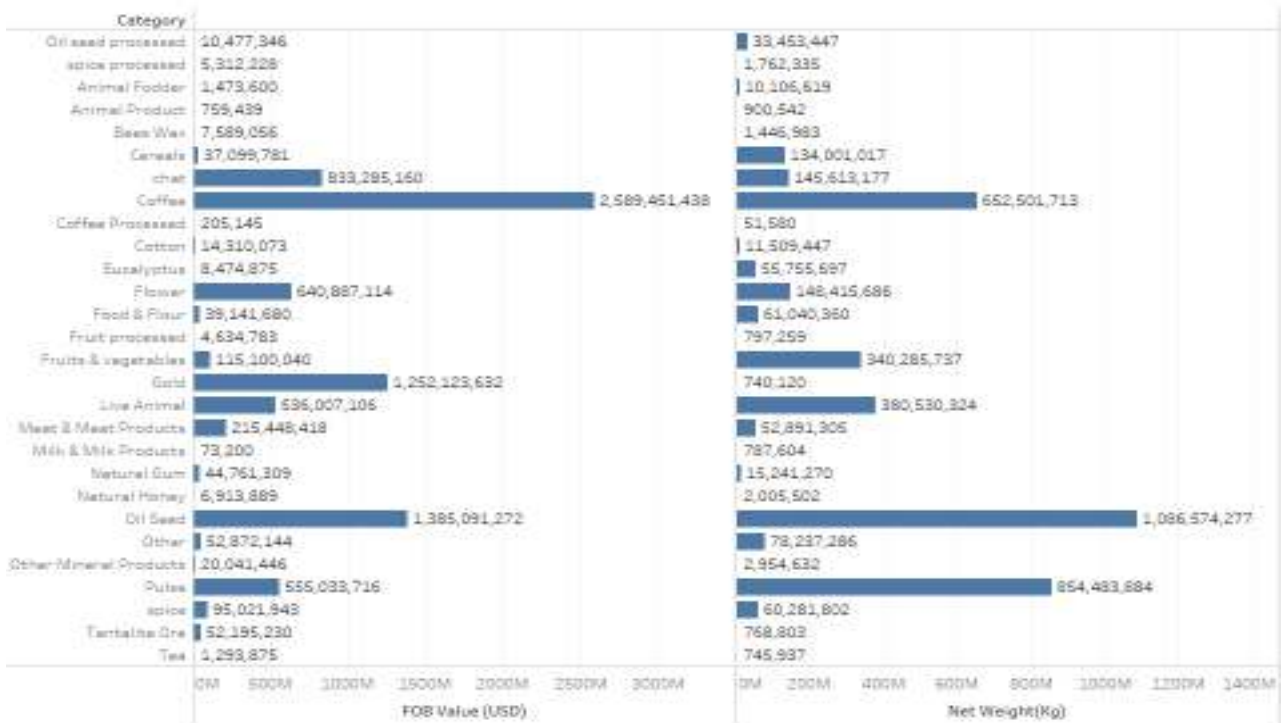


Sum of Net Weight(kg) for each Category

Figure 8 Weight and Category

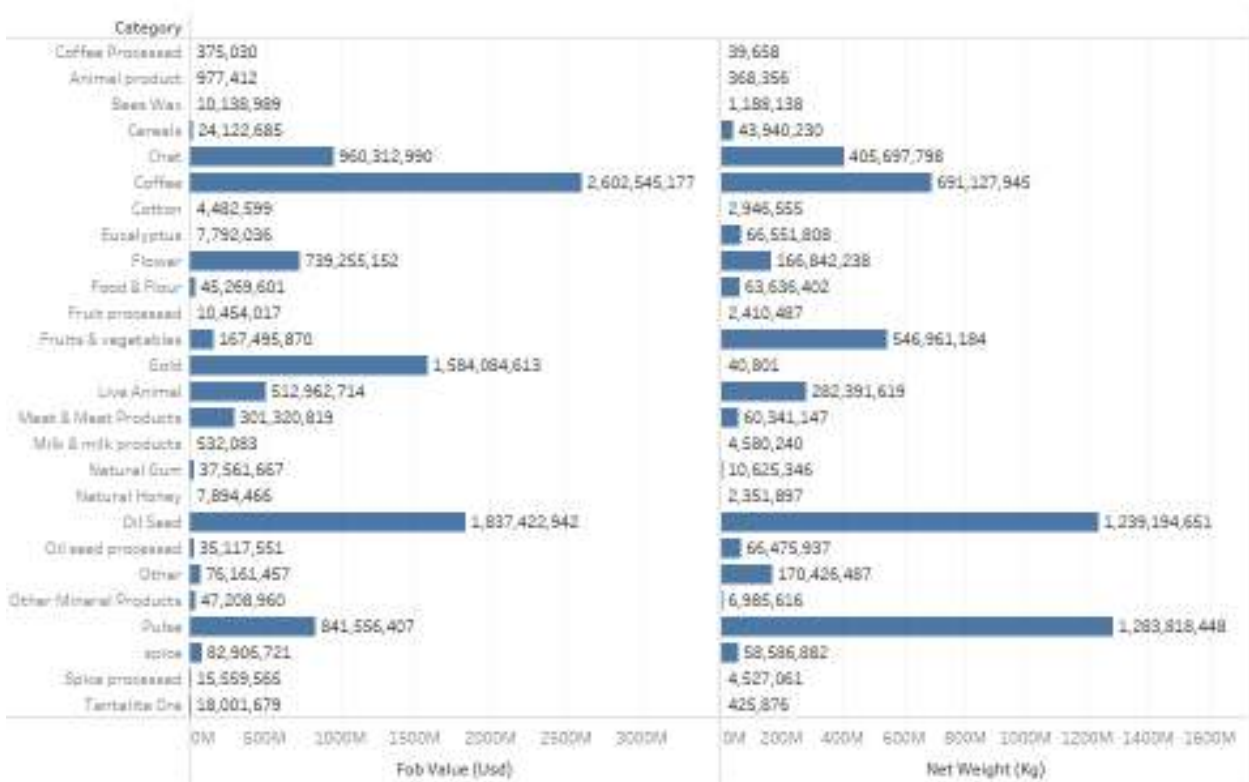
Figure 8 indicates that pulse is the highest in volume then oilseed and third coffee. The lowest export in volume is coffee processed.

Which category is the highest in value and weight



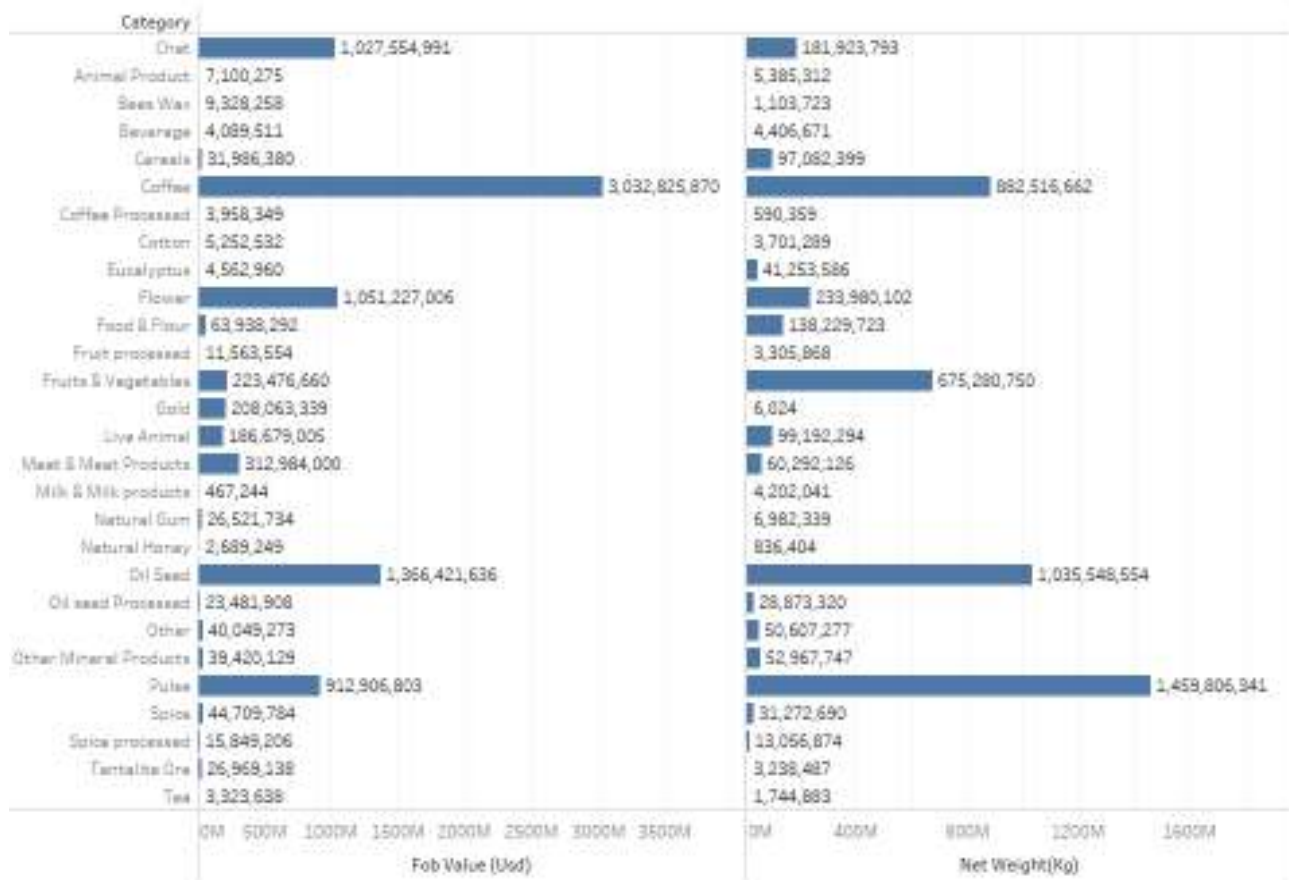
Sum of FOB Value (USD) and sum of Net Weight (Kg) for each Category

Which category is the highest in value and weight



Sum of FOB Value (USD) and sum of Net Weight (Kg) for each Category

Which category is the highest in value and weight



Sum of Fob Value (USD) and sum of Net Weight (Kg) for each Category.

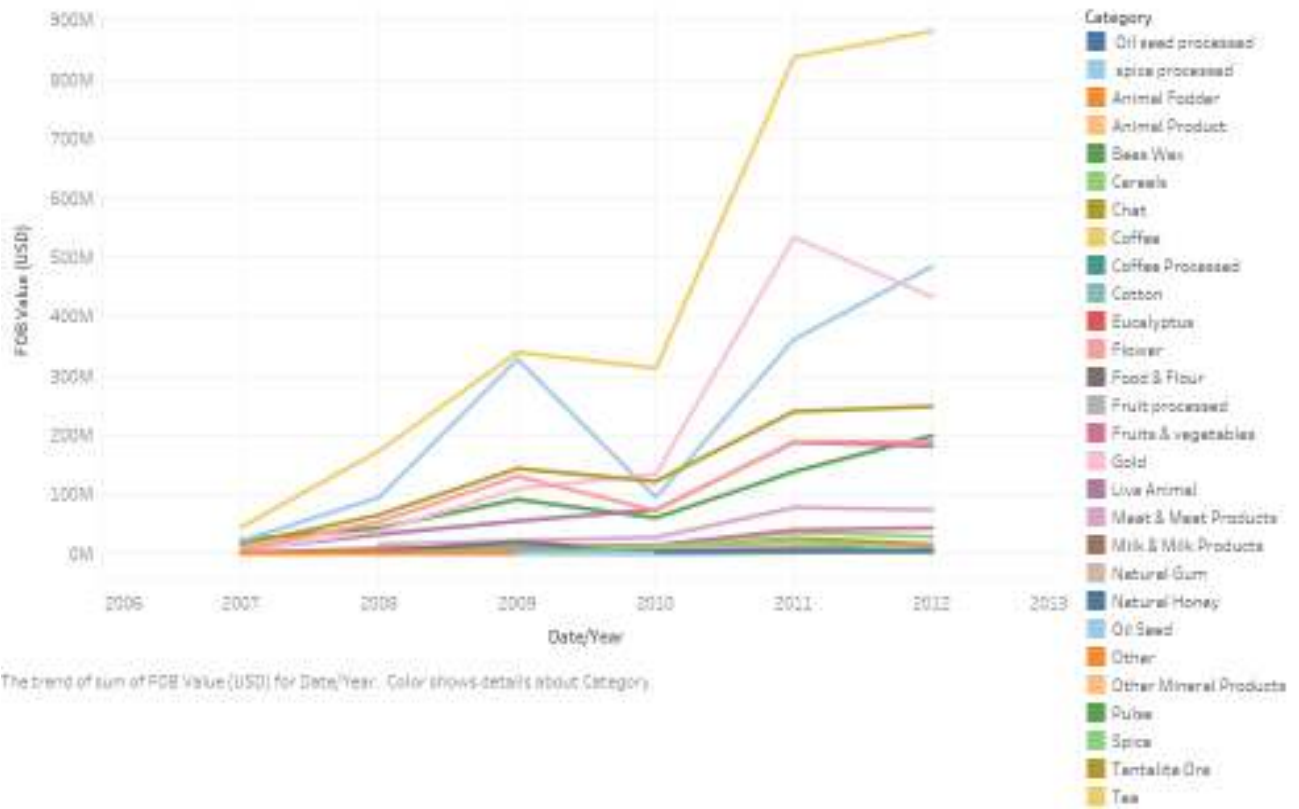
Figure 9 category, value and weight

Figure 9 shows that the highest in both value and volume are coffee and oil seed. Comparing value and weight of each category coffee is high in value and low in weight; oil seed is low in value than weight and pulse is high in volume and low in value.

The Exporting product amount is less than the value this indicates that exporting this type of product has more exporting cost such as production, transporting and warehouse cost.

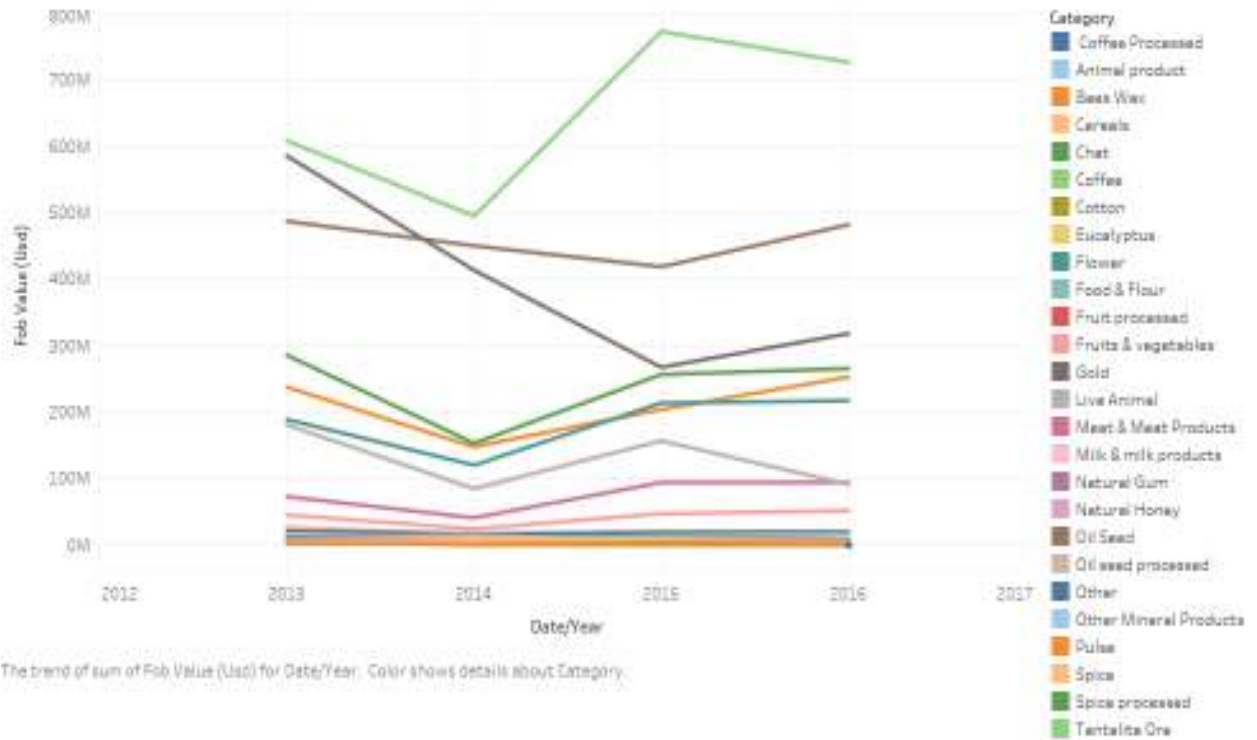
In contrast exporting less weight goods which have high value results in high export earnings

### Export trend over the years



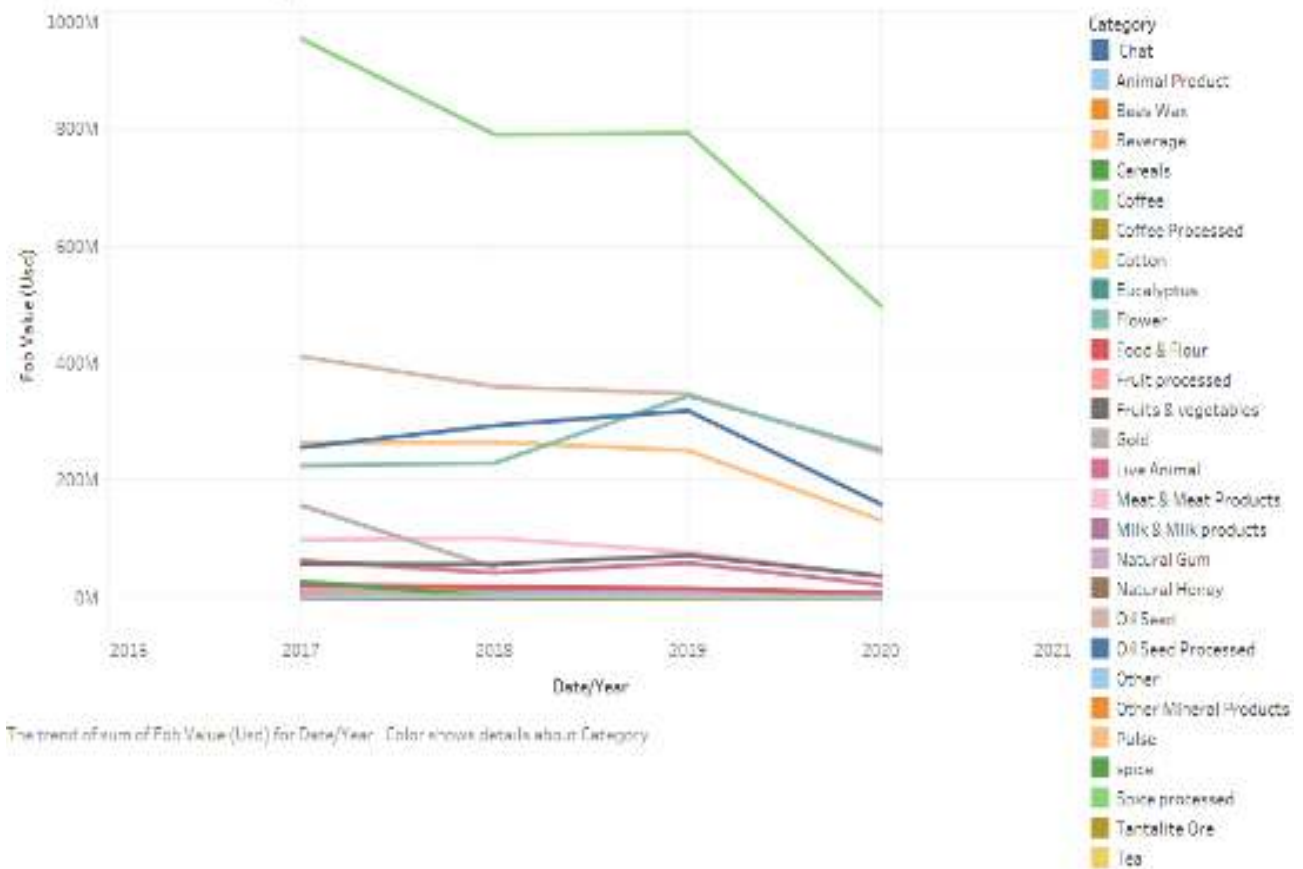
The trend of sum of FOB Value (USD) for Date/Year. Color shows details about Category.

### Export trend over the years



The trend of sum of FOB Value (USD) for Date/Year. Color shows details about Category.

Export trend over the years



The trend of sum of FOB Value (USD) for Date/Year. Color shows details about Category

Figure 10 Value, category and year

As figure 10 reveals that the major category such as coffee, oil seed, pulse, chat and flower are exported all over those years.

**Coffee** in the beginning goes up reached its peak then down again up and down again up some decline then little increment and down some increment then high decline.

**Oilseed** goes up reach peak point then decline again the continuously then slowly decline and little increment again slowly decline.

**Pulse** showed increment then decline and increased again started decline then increased then keep declined.

**Chat** going up then declined continued increment the declined again up then decline and some increment again declined.

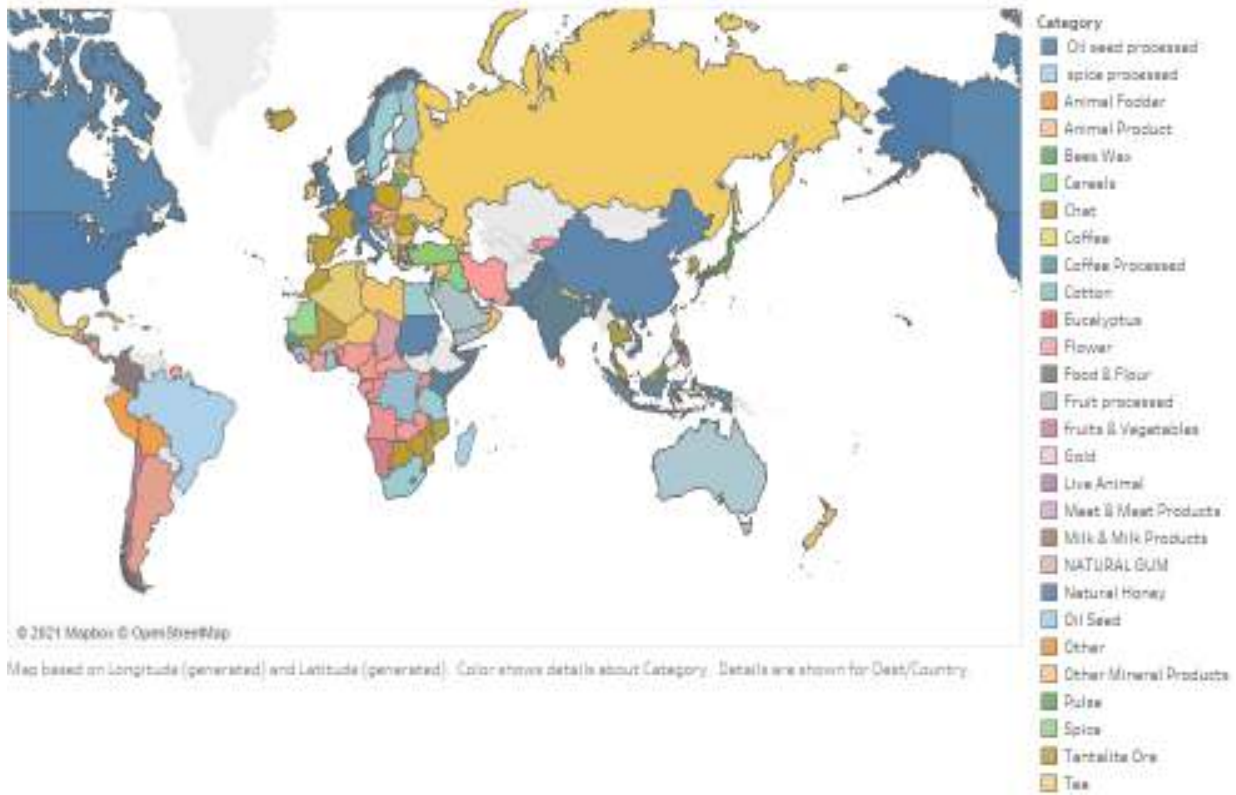
**Flowers** some ups and down then continuously increased reaches its peak and declined.

**Gold** slowly increased and highly increased some decline again up then highly declined and again little increment again highly declined and discontinued or zero export.

The remaining categories are followed the same pattern, didn't exported for some years and there was lack of continuity.

Most of the products declined in 2020.

Which are the major destinations



Which are the major destinations



Which are the major destinations



Figure 11 category and destination

**Figure 11** displays the major destinations for the major exported categories;

**Coffee** United States, Canada, Mexico, Argentina, Brazil, Australia, New Zealand, Latvia Russia, Bulgaria, Portugal, Finland, Sweden, Norway, Romania, Poland, France, Spain, Italy, Germany, Greece, Ukraine, United Kingdom, Ireland, China, Japan, Indonesia, India, Thailand, Iran, Saudi Arabia, Turkey, Yemen, Oman, Libya, Algeria, Morocco, Egypt, Sudan, South Sudan, Kenya, Somalia Nigeria, Ghana, Mali, South Africa, Botswana, Madagascar.

**Oilseed** United States, Canada, Mexico, Brazil, Chile, China, Japan, India, Pakistan, Indonesia, Philippines, Thailand, Saudi Arabia Iran, Iraq, Turkey, Yemen, Oman, Spain, Italy, Germany France, Poland, United Kingdom, Hungary, Bulgaria, Iceland, Finland, Norway, Russia, Australia, Algeria, Morocco, Libya, Nigeria, Egypt Sudan, Kenya, Somalia, South Africa, Mozambique, Madagascar.

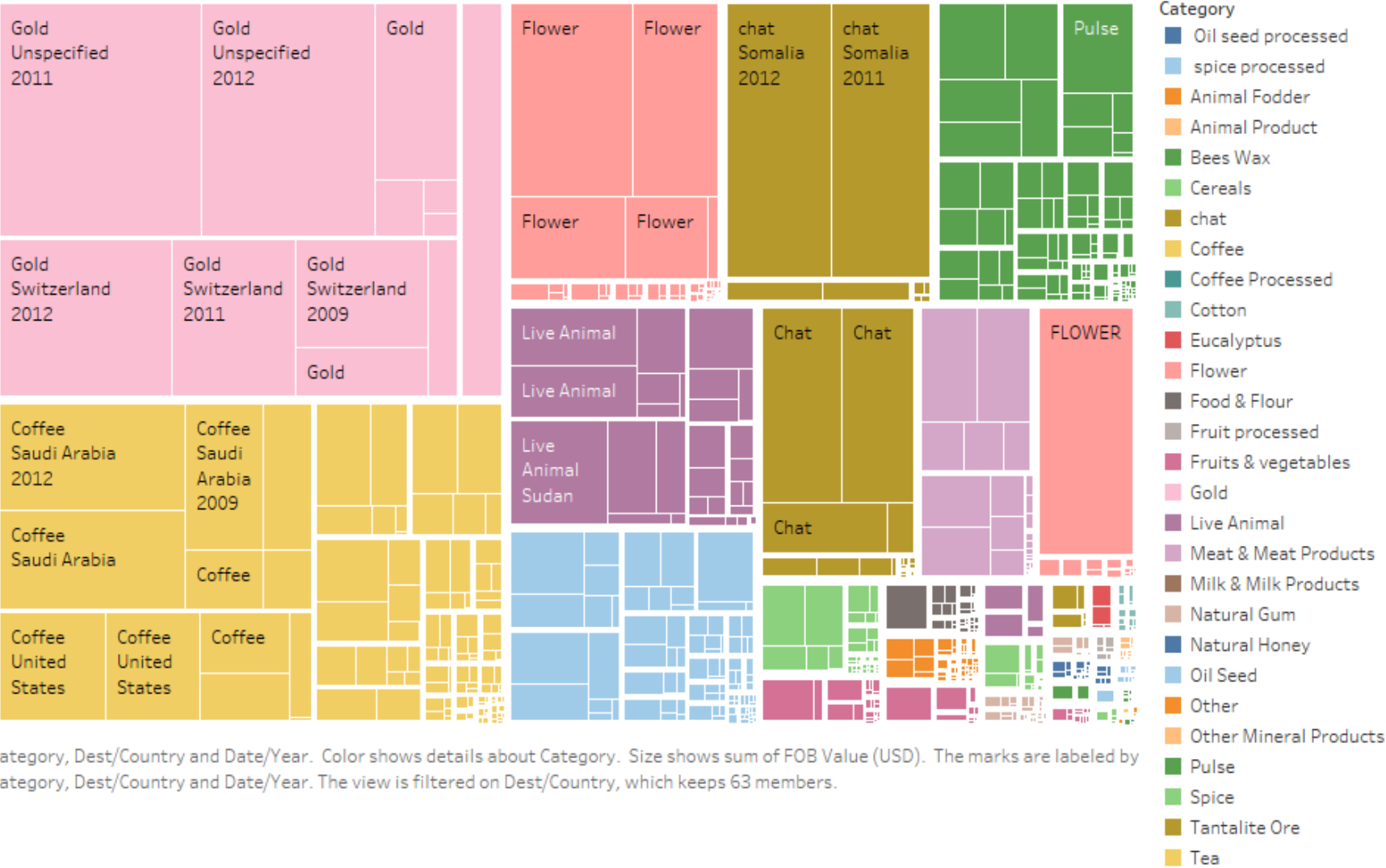
**Chat** China, Japan, Thailand, Indonesia, India, Pakistan, Cambodia, Myanmar, Papua New Guinea, Iran, Yemen, Oman, Turkey, Romania, France, Germany, Spain, Italy, Poland, United Kingdom, Bulgaria, Iceland, Finland, Norway, Canada, United States, Brazil, Argentina, Dominica, Colombia, Chile, Australia, New Zealand, Morocco, Mali, Mauritania, Somalia, Nigeria, South Africa, Angola, Algeria, Egypt, Sudan, Democratic republic of Congo, Congo Kenya, Tanzania, Somalia, Nigeria, Ghana, Mali, Niger, Burkina Faso, Cote d'Ivoire, Guinea, Senegal, Zimbabwe, Mozambique.

**Flower** United States, Canada, Colombia, Chile, China, Japan, India, Indonesia, Malaysia, Thailand, Iran, Turkey, Saudi Arabia, Iraq, Germany, France, Spain, Finland, Sweden, Norway, United Kingdom, Italy, Romania Czech Republic, Poland, Russia, Ukraine, Australia, Gabon, Zimbabwe, Mozambique, Democratic republic of Congo, Nigeria, South Africa, Niger, Egypt, Sudan, Cote d'Ivoire, Guinea, Senegal, Cameroon, Gabon, Tanzania, Kenya, Algeria.

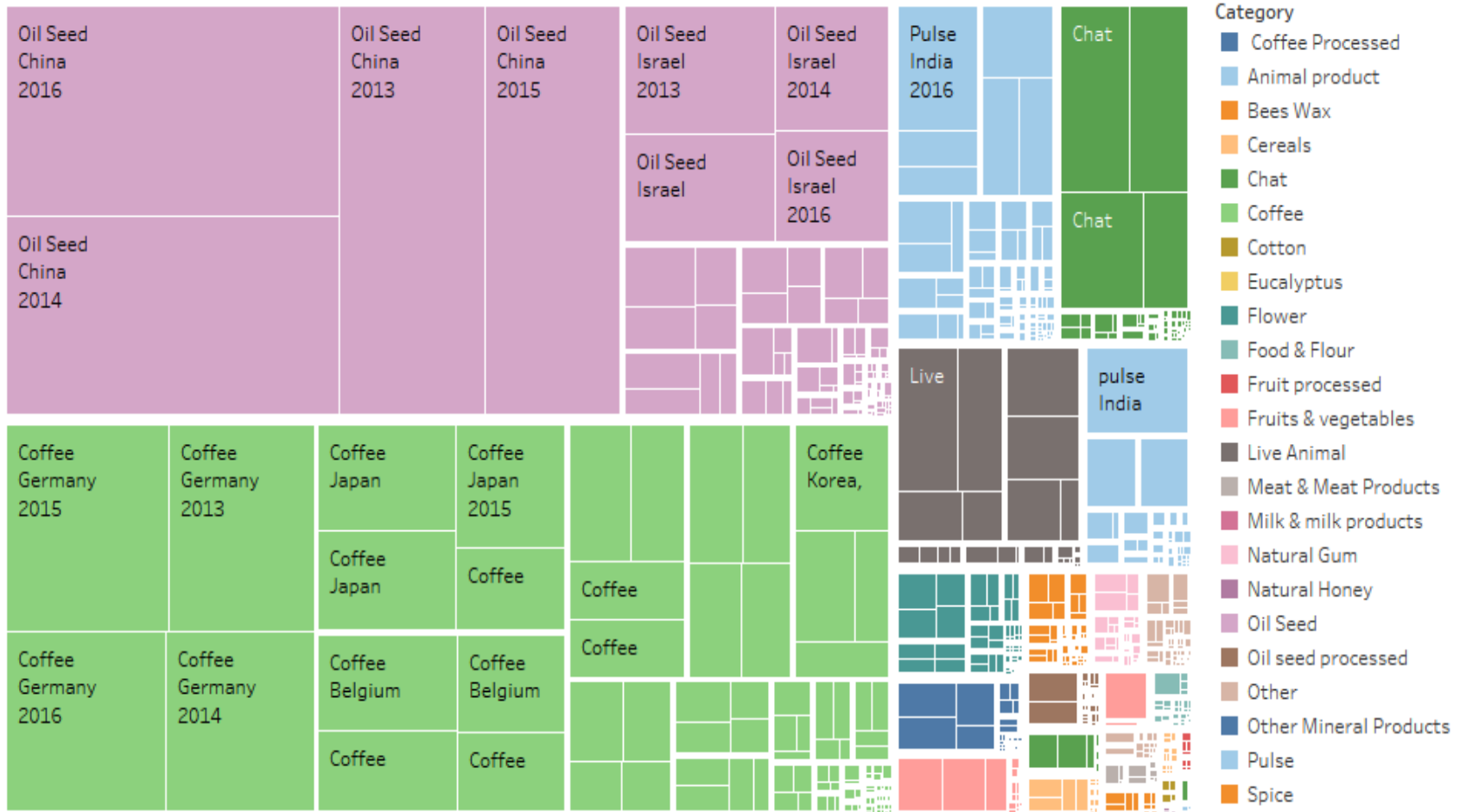
**Pulse** United States, Canada, Honduras, Venezuela, Nicaragua, Panama, Guyana, Brazil, Mongolia, China, Japan, India, Pakistan, Indonesia, Philippines, Iran, Saudi Arabia, Turkey, France, Spain, United Kingdom, Iceland, Germany, Italy, Romania, Poland, Finland, Sweden, Norway, Ukraine, Russia, Australia, South Africa, Angola, Mozambique, Zimbabwe, Algeria, Egypt, Sudan, Democratic republic of Congo, Kenya, Tanzania.



# Highest export to which country(N-Z) in which year



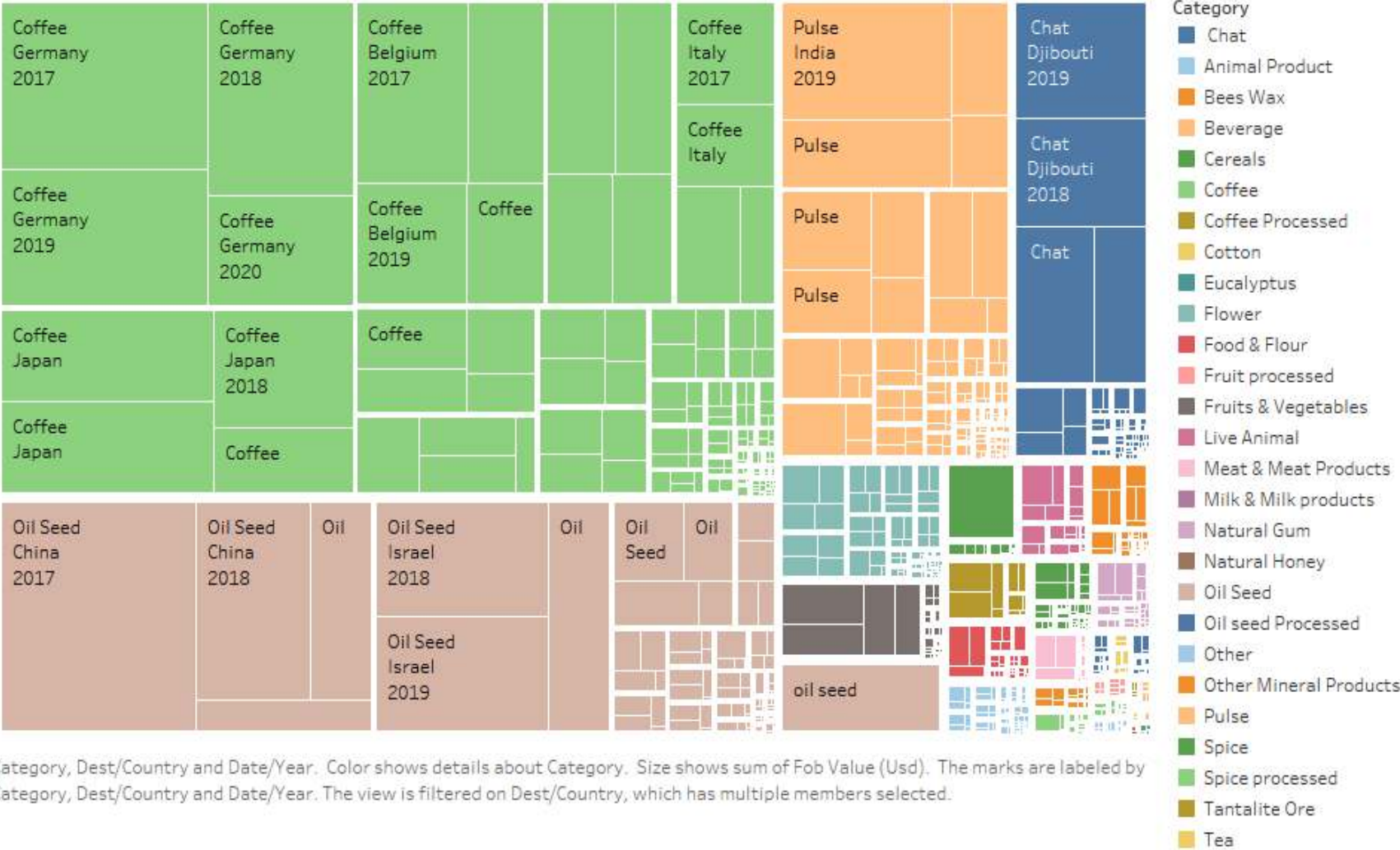
## Highest export to which country(A-M) in which year



Category, Dest/Country and Date/Year. Color shows details about Category. Size shows sum of Fob Value (Usd). The marks are labeled by Category, Dest/Country and Date/Year. The view is filtered on Dest/Country, which has multiple members selected.



### Highest export to which country(A-M) in which year



### Highest export to which country(N-Z) in which year

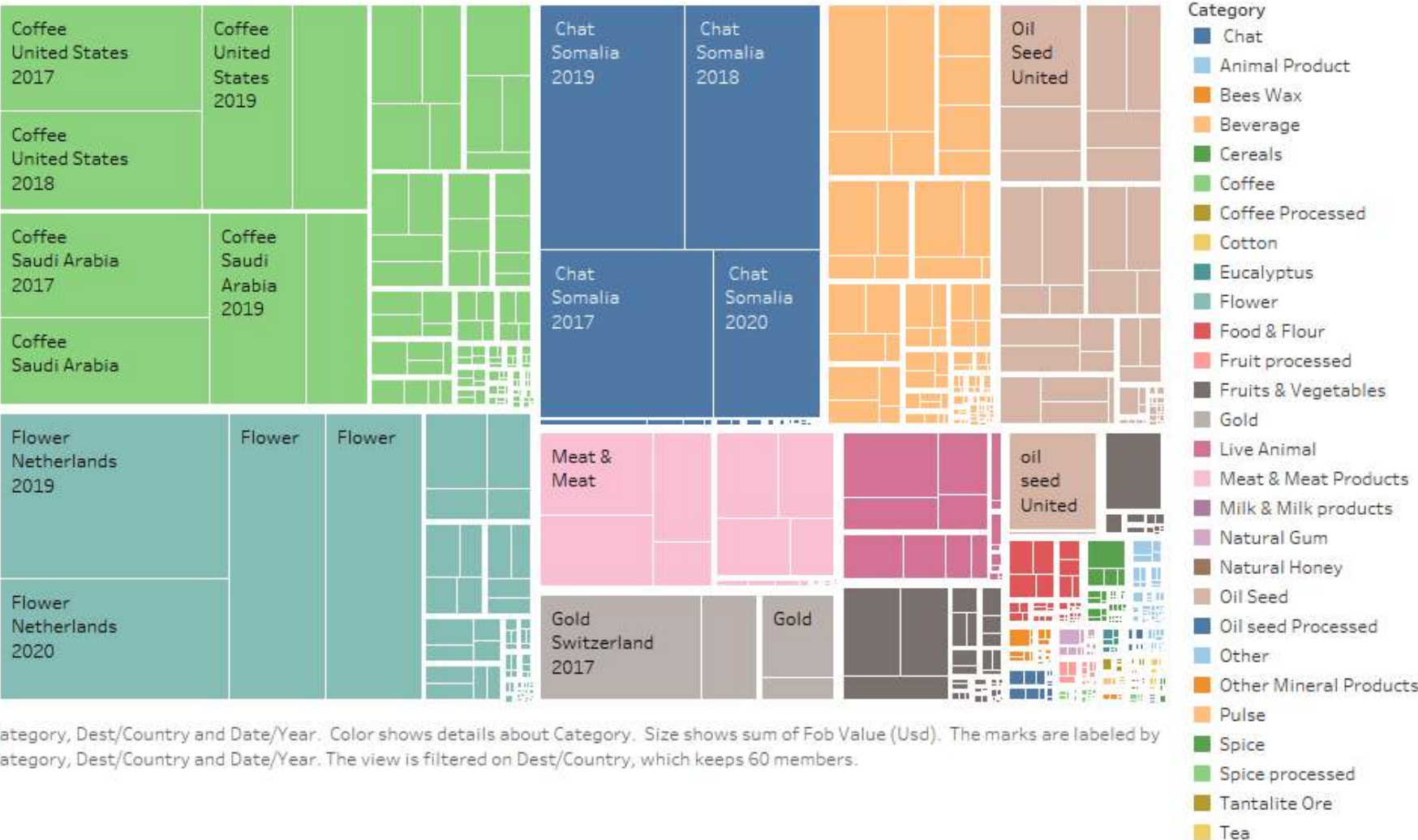


Figure 12 Destination and year

As figure 12 shows exported throughout those years to the following countries;

**Coffee** China, Canada, Saudi Arabia, Netherlands, United States, Sudan, United Kingdom, Russia, Germany, Belgium, Italy, France, Japan, Korea Republic, Australia,

**Oil seed** China, Israel, Jordan Saudi Arabia, United States, United Arab Emirate, Turkey, Japan

**Pulse** Netherlands, India, Sudan, Turkey, Pakistan, Russia

**Chat** Djibouti Somalia, United Kingdom, Israel

**Live Animal** Somalia, Saudi Arabia, United Arab Emirate, Sudan, Yemen, Djibouti

**Flower** Saudi Arabia, Netherlands, United States, Norway, United Kingdom, Germany, Japan

**Fruits & Vegetables** Somalia, Netherlands, Djibouti

**Meat & Meat Products** Saudi Arabia, United Arab Emirate,

**Other Mineral Products** India, Canada

**Spice** Sudan

In 2020 during COVID lock down the following products were exported to these countries

**Flower** Algeria, Colombia, Belgium, Netherlands, Norway, Saudi Arabia, United States, Portugal,

**Coffee** Australia, Canada, China, Germany, Italy, France, Jordan, Belgium, Japan Korea Republic, Netherlands, United Kingdom, Saudi Arabia, United States, United Arab Emirate, Malaysia, Sudan, Macau, Russia, Taiwan,

**Chat** Australia, Djibouti, Somalia, Madagascar,

**Oil Seed** China, Israel, Japan, United Arab Emirate, Singapore, Vietnam, Turkey

**Pulse** China, India, Indonesia, Belgium, Vietnam, Pakistan, Turkey

**Fruits & Vegetables** Djibouti, Netherlands, Somalia

**Live Animal** Somalia, Yemen

**Meat & Meat Products** Saudi Arabia, United Arab Emirate

Even if exported during Covid time, most of the products show decline rather oil seed and Pulse showed increment except in Turkey and Vietnam (Oil seed and Pulse declined in Turkey and Vietnam)

## CHAPTER FIVE

### Summary Conclusion and Recommendation

#### 5.1. summary

Explored the export data through Tableau visualization and conducted analysis to help decision makers and researchers better understand the data and be able to formulate research questions. Tableau visualization revealed valuable discoveries about export pattern of the country and give decision maker a comprehensive picture of the export performance data. Tableau Visualization tool proved to be powerful in transforming export data from Excel spreadsheets into a useful interactive visualization. Tableau allowed decision maker to visually explore export complex datasets and interactively identify potential relationships among data items which is essential to gain knowledge, generate insight and optimize decision-making.

Using visualization tools to understand complex and massive export data has a significant impact on the way decision makers and researchers look at their data synthesize information and draw valid conclusions. Interactive visualization tools like Tableau Software provide an immediate impact on how decision makers explore and analyze the export data. Visually comparing category year and value enabled decision makers to get a deeper understanding of export performance determinants and ultimately make decisive interventions to improve the export performance of the country. Visualization of export performance data enhanced the existing practice of export data analysis at the Ministry of Trade by facilitating data exploration and accelerating the data analysis process which is crucial to make informed decisions. Visually exploring variables and their impacts help analysts build a quick and comprehensive overview of the data, derive insights and gain knowledge about the various factors contributing to the export outcomes of the country. Tableau substantially improves the existing data analysis practices at the organization and amplified decision makers' analytical reasoning and problem understanding capabilities. Contrary to traditional graphical representation, Tableau real-time interactive visualization enabled decision makers to engage and interact with the export datasets and

compare the categories export in different years and consequently identify plausible export effects.

## 5.2. Conclusion

Nowadays data is the heart of most breakthrough technologies in the twenty-first century. Exploring the data using data visualization is very effective way to take advantage of large data and help decision-makers to optimize export. The study clarified that normal map figures and graphics do not have justifying details focused to make proper action in the required time, since different data general figures can distract decision-makers from making the right judgment in order to boost export.

The study used Tableau software to create high-impact visualizations of common data analyses to understand the data. Tableau was exploited to understand the export performance complex data in order to examine and identify the main factors that contribute to the volatility export of the country.

Tableau is a powerful and fastest data visualization tool which can use to connect with almost any database, plot the data and get insights to understand the data properly. Using Tableau create interactive visualizations as well as analyze the data thoroughly. Tableau provide opportunities for key decision-makers to discover export data patterns.

Moreover, the findings answered the research questions and raised pivotal new questions about the trends of export, which can serve as a useful indicator to further study.

## 5.3. Recommendation

The findings come up with the following recommendations for consideration by concerned bodies.

- The most crucial part of any business organization performance is its data. Data is very decisive for the overall performance of every organization. It forms the central part of the organization. Data-driven decision making is vital as it enables us to observe data from the actual time, the real time to come up with predictive insights. It should be every

business obligation to manage its data most conveniently to enhance better performance. It should integrate data-based decision making to come up with essential facts on the decision to make. It should ensure that there are efficient export information system and software for dealing with issues that affect the export sector performance.

- Data driven decision making contributes for the improvement of performance and increment of productivity, thus better to apply business intelligence and analytics system in order to boost the export of the country.
- Some Product categories which has high volume but low in export return so it will be great if more emphasis is given on low volume and high export return products or low exporting cost product categories.
- Most of the categories of product are concentrated on some area hence Looking for new potential market or unattached market is recommended.

#### 5.4. Limitation and Future research direction

Data availability was one of the challenges as most of least developed countries Ethiopia being one of them; this study used only thirteen years data thus future studies could conduct on more years and this study did whole sectors and categories there for future research can do separately for each sectors and categories. Also, further study could extend the research to import and examine the effects on export.

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# APPENDIX 1 Annual Export performance report of Ministry of Trade

የ2010 እና 2011 በጀት ዓመታት የወጪ ንግድ ክንውንን ስፈር

ተ.ቁ	የወጪ ንግድ ምርት	የ2010 በጀት ዓመት የአስራ ሁለት ወራት ክንውን		የ2011 በጀት ዓመት የአስራ ሁለት ወራት ክንውን		የአፈጻጸም ለውጥ		የዕቅድ አፈጻጸም በመቶ	
		መጠን	ገቢ	መጠን	ገቢ	መጠን	ገቢ	መጠን	ገቢ
<b>ሀ</b>	<b>የግብርና ምርቶች ዘርፍ</b>		2,167,413.85		2,099,986.67		(67,427.18)		(3.11)
<b>1</b>	<b>በንግድና ኢንዱስትሪ ሚ/ር ክትትል</b>	853,559.49	964,435.24	792,246.04	964,932.66	(61,313.45)	497.42	(7.18)	0.05
1.1	የቅባት አሰላሾች	342,197.87	418,379.59	260,173.10	388,057.57	(82,024.77)	(30,322.02)	(23.97)	(7.25)
1.2	የጥራጥራ ሰብሎች	436,869.36	268,123.20	458,631.13	265,458.92	21,761.77	(2,664.28)	4.98	(0.99)
1.3	የተፈጥሮ ሙጫ ናይትሮግን	2,482.77	8,897.89	1,113.11	5,147.34	(1,369.66)	(3,750.55)	(55.17)	(42.15)
1.4	ጫት	47,023.94	263,179.11	53,565.90	303,613.58	6,541.96	40,434.47	13.91	15.36
1.5	ባህር ዛፍ	15,582.10	1,708.85	18,135.86	2,087.45	2,553.76	378.60	16.39	22.16
1.6	የብዕርና ንግድ አሰላሾች	9,403.45	4,146.60	626.94	567.79	(8,776.51)	(3,578.81)	(93.33)	(86.31)
<b>2</b>	<b>በግብርና ሚ/ር ክትትል</b>		1,202,978.61		1,135,054.01		(67,924.60)		(5.65)
2.1	የቆም አገልግሎት (ብቁጥር)	387,709.00	61,137.23	444,454.00	45,827.76	56,745.00	(15,309.47)	14.64	(25.04)
3.1	ቡና	238,465.55	838,152.17	230,764.41	762,977.05	(7,701.14)	(75,175.12)	(3.23)	(8.97)
3.2	ቅመማ ቅመም	11,051.01	13,597.26	6,867.75	8,607.13	(4,183.26)	(4,990.13)	(37.85)	(36.70)
3.3	ሻይ ቅጠል	1,744.88	3,323.64	1,496.23	2,499.91	(248.65)	(823.73)	(14.25)	(24.78)
3.4	አበባ (በሚሊዮን ዝንግ)	50,100.88	228,589.21	57,849.31	256,624.47	7,748.43	28,035.26	15.47	12.26
3.5	አትክልትና ፍራፍሬ	187,699.85	58,179.10	182,496.73	58,517.68	(5,203.12)	338.58	(2.77)	0.58
<b>ለ</b>	<b>የግንብ ክትትል ግምርቶች ዘርፍ</b>		458,646.30		453,597.53		(5,048.77)		(1.10)
4.1	ቆይታ የቆይታ ጥገና		132,479.49		119,375.93		(13,103.56)		(9.89)
	ክረስት			157.82	475.26		475.26		
	ያለቀለት ቆይታ	3,911.81	76,085.93	3,123.86	62,968.75	(787.95)	(13,117.18)	(20.14)	(17.24)
	ጫማ	2,175.84	46,915.38	2,023.35	43,034.24	(152.49)	(3,881.14)	(7.01)	(8.27)
	የቆይታ አልባሳትና ዕቃዎች	322.42	9,478.18	596.28	12,897.68	273.86	3,419.50	84.94	36.08
4.2	ጨርቃጨርቅና አልባሳት		106,250.90	19,888.80	152,859.54	19,888.80	46,608.64		43.87
	ፅፁ	2,227.84	3,166.51	252.91	311.57	(1,974.93)	(2,854.94)		
4.3	ምግብ የመጠጥና ፍራግት ክልል	23,198.06	35,514.59	24,648.00	35,362.47	1,449.94	(152.12)	6.25	(0.43)
	ዱቄትና ምግቦች	8,887.04	15,397.97	10,433.82	14,337.40	1,546.78	(1,060.57)	17.40	(6.89)
	መጠጥ	3,567.14	4,165.91	4,406.67	4,089.52	839.53	(76.39)	23.54	(1.83)

	የቅባትአሀልወጠቶች	7,571.49	6,421.76	4,032.10	5,862.35	(3,539.39)	(559.41)	(46.75)	(8.71)
	የተዘጋጁየፍራፍሬወጠቶች	1,364.32	3,311.29	654.22	3,047.50	(710.10)	(263.79)	(52.05)	(7.97)
	የተዘጋጁቅመም	1,532.77	3,356.90	4,707.64	5,006.76	3,174.87	1,649.86	207.13	49.15
	የተቆላበፍ	107.28	858.83	167.00	1,130.03	59.72	271.20	55.67	31.58
	መድሐኒት	16.76	314.09	22.75	394.59	5.99	80.50		25.63
	የአንስሳትመድሐኒት	12.95	1,044.44	25.81	736.82	12.86	(307.62)	99.28	(29.45)
	የፀጉርቅባት	124.77	263.93	181.93	334.72	57.16	70.79	45.81	26.82
	ባደካፕሱል	13.54	379.47	16.06	422.78	2.52	43.31	18.64	11.41
<b>4.4</b>	<b>የሥነምግባርናቴክኖሎጂድጋፊ</b>	<b>23,025.42</b>	<b>107,593.44</b>	<b>21,011.11</b>	<b>94,492.89</b>	<b>(2,014.31)</b>	<b>(13,100.55)</b>	<b>(8.75)</b>	<b>(12.18)</b>
	ሥነ	19,683.92	101,543.22	17,198.97	88,204.90	(2,484.95)	(13,338.32)	(12.62)	(13.14)
	የሥነምግባር	868.72	1,747.23	1,733.30	3,151.27	864.58	1,404.04	99.52	80.36
	ማር	316.3	938.55	134.43	478.74	(181.87)	(459.81)	(57.50)	(48.99)
	ሰም	358.7	3,040.81	283.18	2,407.05	(75.52)	(633.76)	(21.05)	(20.84)
	ዓሳ	260.54	116.34	273.90	113.77	13.36	(2.57)		
	ወተትናየወተትተዋጽኦ	1,537.24	207.29	1,387.33	137.16	(149.91)	(70.13)	(9.75)	(33.83)
<b>4.5</b>	<b>የኮሚኒኬሽንናጥራትፍጠራናጥምምረት</b>	<b>276,029.32</b>	<b>24,394.99</b>	<b>168,824.13</b>	<b>16,196.69</b>	<b>(107,205.19)</b>	<b>(8,198.30)</b>	<b>(38.84)</b>	<b>(33.61)</b>
<b>4.6</b>	<b>ብረታብረት</b>	<b>1,427.29</b>	<b>1,137.51</b>	<b>461.65</b>	<b>828.90</b>	<b>(965.64)</b>	<b>(308.61)</b>	<b>(67.66)</b>	<b>(27.13)</b>
<b>4.7</b>	<b>ስኳር</b>					-	-		
<b>4.8</b>	<b>ሞላሰስ</b>	<b>35,871.18</b>	<b>5,318.87</b>	<b>36,175.00</b>	<b>3,099.36</b>	<b>303.82</b>	<b>(2,219.51)</b>	<b>0.85</b>	<b>(41.73)</b>
<b>4.9</b>	<b>ኤሌክትሮኒክስ</b>	<b>4,551</b>	<b>42,790</b>	<b>4,510.34</b>	<b>31,070.17</b>	<b>(40.66)</b>	<b>(11,719.83)</b>	<b>(0.89)</b>	<b>(27.39)</b>
<b>ሐ</b>	<b>የማዕከላዊ</b>	<b>24,595.21</b>	<b>122,582.88</b>	<b>15,193.83</b>	<b>46,182.43</b>	<b>(9,401.38)</b>	<b>(76,400.45)</b>	<b>(38.22)</b>	<b>(62.33)</b>
<b>5.1</b>	<b>ወርቅ</b>	<b>2.8</b>	<b>100,150.00</b>	<b>0.82</b>	<b>27,893.89</b>	<b>(1.98)</b>	<b>(72,256.11)</b>	<b>(70.60)</b>	<b>(72.15)</b>
<b>5.2</b>	<b>ታንታለም</b>	<b>2640.72655</b>	<b>9,282.83</b>	<b>386.19</b>	<b>9,754.30</b>	<b>(2,254.54)</b>	<b>471.47</b>	<b>(85.38)</b>	<b>5.08</b>
<b>5.3</b>	<b>ሌሎችማዕከላዊ</b>	<b>21,951.69</b>	<b>13,150.05</b>	<b>14,806.82</b>	<b>8,534.24</b>	<b>(7,144.87)</b>	<b>(4,615.81)</b>	<b>(32.55)</b>	<b>(35.10)</b>
<b>መ</b>	<b>ሌሎች</b>		<b>87,245.78</b>		<b>66,457.55</b>	-	<b>(20,788.23)</b>		<b>(23.83)</b>
<b>6.1</b>	<b>ኤሌክትሮኒክስ</b>	-	<b>80,020.39</b>	-	<b>55,442.02</b>		<b>(24,578.37)</b>		<b>(30.72)</b>
<b>6.2</b>	<b>ሌሎችምርቶች</b>	<b>10,000.32</b>	<b>7,225.39</b>	<b>14,968.60</b>	<b>11,015.53</b>	<b>4,968.28</b>	<b>3,790.14</b>	<b>49.68</b>	<b>52.46</b>
	<b>ጠቅላላ</b>		<b>2,835,888.81</b>		<b>2,666,224.18</b>	-	<b>(169,664.63)</b>		<b>(5.98)</b>

## 2011 Eth. Budget Year Export by Destination

Value in 000 USD      Volumes in TON

NO	COUNTRY	VOLUME	VALUE	% SHARE
1	United States	57,977.58	283,222.66	10.62
2	Somalia	221,926.01	257,866.86	9.67
3	Netherlands	51,642.59	213,027.21	7.99
4	Saudi Arabia	67,498.16	183,179.87	6.87
5	China	73,202.26	156,778.39	5.88
6	United Arab Emirates	74,576.44	137,542.79	5.16
7	Djibouti	214,461.42	132,244.07	4.96
8	Germany	44,293.09	126,477.31	4.74
9	Japan	48,707.91	122,122.45	4.58
10	Israel	62,129.81	106,381.63	3.99
11	India	160,879.20	89,593.70	3.36
12	Sudan	60,309.93	68,280.19	2.56
13	Viet Nam	56,951.99	66,972.25	2.51
14	Belgium	20,221.63	61,465.49	2.31
15	Italy	16,652.55	57,077.13	2.14
16	Yemen	45,047.10	55,461.16	2.08
17	Korea, Republic of	13,203.80	46,936.40	1.76
18	Turkey	49,019.47	45,809.49	1.72
19	United Kingdom	13,538.59	43,286.39	1.62
20	Indonesia	29,792.36	29,098.21	1.09
21	Egypt	34,614.97	26,406.32	0.99
22	Singapore	14,810.76	22,909.01	0.86
23	Kenya	45,376.52	22,019.91	0.83
24	Australia	5,164.01	20,626.97	0.77
25	France	7,979.44	20,535.53	0.77

<b>NO</b>	<b>COUNTRY</b>	<b>VOLUME</b>	<b>VALUE</b>	<b>% SHARE</b>
26	Spain	11,095.73	19,720.88	0.74
27	Jordan	9,274.24	19,704.78	0.74
28	Canada	4,325.18	16,799.52	0.63
29	Taiwan, Province of China	4,318.56	15,471.19	0.58
30	Hong Kong	1,668.48	13,582.58	0.51
31	Russian Federation	9,148.24	12,503.03	0.47
32	Nigeria	1,405.49	11,826.60	0.44
33	Togo	64.42	9,017.43	0.34
34	South Africa	6,722.69	8,557.19	0.32
35	Greece	3,957.84	7,776.11	0.29
36	Portugal	11,963.09	7,610.37	0.29
37	Norway	1,938.08	7,354.94	0.28
38	Pakistan	11,011.98	6,850.98	0.26
39	Sweden	1,945.12	6,051.23	0.23
40	Thailand	109.28	6,018.18	0.23
41	Finland	1,172.18	4,869.05	0.18
42	Mexico	2,393.33	4,858.60	0.18
43	Bahrain	1,498.37	4,834.57	0.18
44	New Zealand	728.82	4,351.41	0.16
45	Iran, Islamic Republic of	5,313.60	3,766.35	0.14
46	Kuwait	1,213.95	3,435.09	0.13
47	Bulgaria	4,162.01	3,310.66	0.12
48	Algeria	1,798.00	2,818.51	0.11
49	Latvia	439.94	2,232.16	0.08
50	South Sudan	4,895.60	2,212.10	0.08
51	Oman	763.60	2,187.69	0.08
52	Lebanon	1,258.45	2,132.79	0.08

<b>NO</b>	<b>COUNTRY</b>	<b>VOLUME</b>	<b>VALUE</b>	<b>% SHARE</b>
53	Bangladesh	1,236.08	2,113.49	0.08
54	Eritrea	1,399.59	2,064.40	0.08
55	Ghana	50.67	1,658.32	0.06
56	Qatar	319.91	1,559.27	0.06
57	Rwanda	21.73	1,412.18	0.05
58	Switzerland	1,138.71	1,393.55	0.05
59	Angola	456.67	1,315.74	0.05
60	Zambia	26.43	1,296.17	0.05
61	Ukraine	534.98	1,266.85	0.05
62	Malaysia	514.75	1,102.79	0.04
63	Denmark	514.43	1,032.01	0.04
64	Ireland	367.27	1,000.81	0.04
65	United Republic of Tanzania	22.66	971.02	0.04
66	Senegal	5.15	901.00	0.03
67	Uganda	110.87	885.53	0.03
68	Tunisia	304.01	880.03	0.03
69	Sri Lanka	364.70	878.38	0.03
70	Hungary	387.41	720.08	0.03
71	Iraq	488.86	646.66	0.02
72	Poland	193.57	615.06	0.02
73	Austria	59.92	606.54	0.02
74	Lithuania	588.02	567.53	0.02
75	Cameroon	23.39	560.48	0.02
76	Morocco	360.33	543.44	0.02
77	Cyprus	134.40	541.31	0.02
78	Slovenia	130.80	481.14	0.02
79	Romania	127.20	444.07	0.02

<b>NO</b>	<b>COUNTRY</b>	<b>VOLUME</b>	<b>VALUE</b>	<b>% SHARE</b>
80	El Salvador	602.73	364.55	0.01
81	Korea, Democratic People's Rep. of	288.72	349.38	0.01
82	Georgia	212.14	345.31	0.01
83	Croatia	286.28	337.58	0.01
84	Chad	10.35	313.29	0.01
85	Zimbabwe	191.45	305.17	0.01
86	Puerto Rico	320.00	271.09	0.01
87	Madagascar	79.35	264.26	0.01
88	Peru	119.50	252.24	0.01
89	Czech Republic	343.28	252.02	0.01
90	Libyan Arab Jamahiriya	165.02	239.63	0.01
91	Burundi	5.68	199.49	0.01
92	Estonia	46.69	185.12	0.01
93	Democratic republic of the Congo	17.57	170.34	0.01
94	Benin	33.76	148.65	0.01
95	Jamaica	192.00	140.19	0.01
96	Cote d'Ivoire	24.80	138.58	0.01
97	Niger	13.26	136.34	0.01
98	Cambodia	2.42	116.57	0.004
99	Myanmar	31.28	98.49	0.004
100	Chile	11.62	91.57	0.003
101	Philippines	49.34	79.68	0.003
102	Guatemala	13.15	77.90	0.003
103	Afghanistan	21.64	75.91	0.003
104	Seychelles	20.49	75.57	0.003
105	Nicaragua	144.00	70.56	0.003
106	Slovakia	0.95	70.41	0.003

<b>NO</b>	<b>COUNTRY</b>	<b>VOLUME</b>	<b>VALUE</b>	<b>% SHARE</b>
107	Albania	19.68	60.90	0.002
108	Venezuela	48.40	52.06	0.002
109	Guinea	7.53	47.39	0.002
110	Burkina Faso	0.36	39.13	0.001
111	Azerbaijan	14.53	30.06	0.001
112	Maldives	1.01	28.95	0.001
113	Mauritania	9.46	26.44	0.001
114	Armenia	40.26	23.93	0.001
115	Bhutan	0.61	21.45	0.001
116	Gabon	7.13	17.51	0.001
117	United States Virgin Islands	0.34	16.76	0.001
118	Liberia	0.47	16.38	0.001
119	Brazil	1.58	15.84	0.001
120	Namibia	0.42	14.55	0.001
121	Nepal	23.02	14.38	0.001
122	Guyana	24.00	14.37	0.001
123	Botswana	2.27	12.74	0.0005
124	Mali	0.69	11.73	0.0004
125	Gambia	0.43	10.48	0.0004
126	Equatorial Guinea	2.66	8.14	0.0003
127	Sierra Leone	0.20	7.08	0.0003
128	Mozambique	0.20	6.53	0.0002
129	Mauritius	0.09	4.82	0.0002
130	Guinea-Bissau	0.11	3.79	0.0001
131	Antigua and Barbuda	0.09	3.31	0.0001
132	Brunei Darussalam	0.09	3.01	0.0001
133	Bermuda	0.21	2.87	0.0001

NO	COUNTRY	VOLUME	VALUE	% SHARE
134	Malawi	0.06	2.18	0.0001
135	Swaziland	0.53	1.86	0.0001
136	Luxembourg	0.21	1.74	0.0001
137	Comoros	0.05	1.60	0.0001
138	Cook Islands	0.00	1.20	0.00004
139	Bosnia and Herzegovina	1.10	1.02	0.00004
140	Malta	0.02	0.86	0.00003
141	Kazakhstan	0.15	0.59	0.00002
142	Lao People's Democratic Republic	0.12	0.50	0.00002
143	Costa Rica	0.02	0.38	0.00001
144	Anguilla	0.01	0.27	0.00001
145	Colombia	0.05	0.22	0.00001
146	Central African Republic	0.00	0.15	0.00001
147	Unspecified	0.82	27,893.89	1.05
<b>Total</b>		<b>1,607,902.80</b>	<b>2,666,224.18</b>	<b>100.00</b>

## APPENDIX 2 Description of the product categories

### Manufacturing products Category

Animal vaccine –Vaccine &Diluents, vaccines for veterinary medicine

Capsule – Empty hard gelatin capsule

Crust– Sheep crust, Goat crust

Finished Leather- Cow Lining, Sheep lining, Goat suede

Hair oil – Zenith Paraffin

Leather product- Bags, Glove, and wallet

Other–Soap, Medicines, article of leather, bags (non-leather), tooth brush, plastic scrap, baby bicycle

Shoes Men shoes, Women shoes, Ladies Boots

Textile and garment –Fabric, Bed sheet, Dress, Cotton Pillows, Gawon, T-Shirt, Trousers, Jackets, Scarf ,Carpets

Tyre

### **Agricultural Commodities and Mineral products category**

Coffee – Not Roasted or decaffeinated coffee

Coffee processed–Roasted not decaffeinated

Pulse – Chick peas, Beans, Lupin

Spice– Mustard, pepper, coriander, Black cumin, Turmeric, Fenugreek, Niche Azmud

Spice processed -

Oil seed –Sesame seed, Line seed, Niger seed, groundnut, castor seed

Oilseed processed -

Cereals – Oats, Teff

Fruits& vegetables – Mango, Papaya, Straw berry, Orange, Lemon, Avocado, Guava, Ambshuke, Beetroot

Fruit processed - Fruit Juice, meals

Food&flour –Chick pea flour, Beso, Bula, Shiro, Fresh Injera, Kolo, Kocho

Chat – First and second grade fresh chat

Flower – rose flower, fresh cut flower, cuttings, summer flower

Cotton – raw cotton, combed cotton waste

Eucalyptus -

Natural honey – fresh honey, white and red honey

Bees wax – Crude bees wax, melted and refined bees wax

Naturalgum -

Meat and meat products – Mutton, Beef, Goat meat, Sheep meat

Milk and milk products – Second grade Fresh Milk, butter

Gold -

Tantalite ore – Ethiopian Tantalite ore

Other mineral products–Opal, Emerald, Sappier, Marble, and Basalt gravel

Other –Cooking oil, coffee set (Jebena, rekobot, Medija), mesob, Taba for Kitfo, Ecence, Nyala cigarette, Hand crafts.