



# COMMODITY INSIGHTS

— YEARBOOK 2020 —

Disclaimer: This Yearbook is being made available for the limited purpose of creating awareness about commodity derivatives and related markets and is provided on an available basis. Along with MCX information, this report also contains the information obtained from third party sources/ market sources on best effort basis. The user of the information assumes the entire risk of any use of such information provided herein at its sole discretion. Every effort has been made to ensure accuracy and reliability of the information to the best of its endeavors, NISM or MCX or the MCX IPF Trust makes no warranty or representation as to the accuracy, completeness or reliability of any of the information along with the third party information contained herein and expressly disclaims any and all liability whatsoever to any person for any damage or loss of any nature arising out of use or as a result of reliance, any error, misrepresentations or omissions of any of the information provided herein. The originality of the content, opinions and views expressed by the authors of the articles are those of only the authors and do not necessarily reflect those of NISM or MCX IPF or the organizations/companies/institutions they bear allegiance to. Notwithstanding the content in any part of the book, neither of the two institutions provide nor endorse any forward-looking statement or a price view. The information contained in this document is not intended to provide any professional council or investment advice.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form, or by any means – electronic, photocopying, recording, scanning, or otherwise – without explicit prior permission of NISM or MCX.

NiSM NATIONAL INSTITUTE OF  
SECURITIES MARKETS  
An Educational Initiative of SEBI

**MCX**  
METAL & ENERGY  
Trade with Trust

**MCX INVESTOR PROTECTION FUND**

# COMMODITY INSIGHTS

Y E A R B O O K 2 0 2 0



# CONTENTS

Foreword

Preface

<b>I.</b>	<b>INDIAN COMMODITY DERIVATIVES MARKETS – OVERCOMING COVID-19</b>	<b>03</b>
<b>II.</b>	<b>EMERGING TRENDS</b>	<b>07</b>
1.	<b>Atmanirbhar Bharat Abhiyan and the Development of Agricultural Commodity Markets</b> - Jayant Nalawade	08
<b>Special Focus: Precious Metals</b>		
	<b>Theme Note: Precious Metals – Prospects, Issues and Perspectives</b>	14
2.	<b>Gold as an Asset class for Investment</b> - Latha Chari, Pradiptarathi Panda and V. R. Narasimhan	16
3.	<b>What would it take India to be a price-setter in global gold market?</b> - G. Chandrashekhar	22
4.	<b>Role of Bullion Banks in the development of Indian Gold Markets</b> - Harish Chopra	26
5.	<b>Gold: Time tested store of value and effective portfolio diversifier</b> - Chirag Mehta and Ghazal Jain	30
6.	<b>Domestic Gold Refining Industry: Challenges and the Way Forward</b> - Paramita Mukherjee and Vivekananda Mukherjee	36
7.	<b>Harnessing Gold Resources for Development in India: The Sustainability Dimension</b> - Prabhakar Sangurmath	41
<b>III.</b>	<b>STATISTICS</b>	<b>49</b>
	<b>Key Economic Indicators</b>	<b>50</b>
	<b>Non-Agricultural Commodities</b>	<b>63</b>
	• Precious Metals – Gold & Silver	65
	• Base Metals – Aluminium, Copper, Lead, Nickel & Zinc	79
	• Energy Commodities– Crude Oil & Natural Gas	101
	<b>Agricultural Commodities</b>	<b>115</b>
	• Cotton	117
	• Oilseeds Complex – CPO & Castor Seed	123
	• Spices – Cardamom, Mentha Oil, Pepper	131



## FOREWORD



It is a delight to observe that MCX and NISM have continued the tradition of publishing year book this year as well bringing about relevant statistics and insightful articles relevant to the development of commodity derivatives markets. This year is certainly very different for the commodity markets from the known history of the commodity markets due to the unprecedented Covid pandemic. Putting together this book during this year of 'no movements', 'lockdowns' and 'work from home' was a difficult task but MCX and NISM have achieved it.

Covid pandemic has made it difficult to withstand commercial pain to several sectors in the market. This pain was exacerbated by 'migrant labour' problem which created imbalance in demand and supply of labour; as the migrant labour went back to their 'homes' in rural India causing shortage of labour in industrial and urban centres of the country. This has a direct adverse impact on commodity derivatives markets as well, since all commodities depend on labour, industrial consumption and production.

Government of India have pursued '*Atma Nirbhar Bharat Abhiyan*' and have announced massive financial support package to all sectors including agricultural sector; the package when fully implemented is likely to transform the face and contours of "Bharat" by creating enormous agricultural and rural infrastructure which would directly contribute to the growth of trade in agricultural products and agri based industry. Further, the agricultural sector is poised for a revolutionary change with the passage of The Farmers' Produce Trade and Commerce (Promotion and Facilitation) Bill, 2020, The Farmers (Empowerment and Protection) Agreement of Price Assurance and Farm Services Bill, 2020 and The Essential Commodities (Amendment) Bill, 2020. Once the benefits of these bills start flowing to the farmers, there is no doubt that commodity derivatives markets for agricultural commodities will reach new heights and deliver the benefits they are intended to deliver to the farm sector.

This publication will endeavour to highlight the efforts being made under *Atma Nirbhar Bharat Abhiyan*. India is one of the largest consumers of gold in the world and has significant production too. But for historical reasons, it has been a 'price taking market' rather than 'price setting market'. This publication throws light on what it takes to become a price setting market and perspectives on facets of Indian gold markets.

**S. K. Mohanty**  
Director NISM and WTM SEBI

## PREFACE



The Indian commodity derivatives market has encountered a significant challenge in 2020 in the form of the global pandemic Covid-19. Yet, the market has been able to maintain its growth trajectory due to a slew of supportive measures from the regulator, exchanges and other entities in the market ecosystem. The market was also supported by adequate liquidity in the financial system, ensured by an accommodative monetary policy, as well as timely stimulus packages and policy reforms from the Government of India as part of the Atma Nirbhar Bharat initiative.

Overcoming the initial shock of the lockdown, India's commodity derivatives market not only recovered quickly but also made a headway with the successful launch of products in two new categories: options in goods and commodity index futures. Further, the Indian commodity derivatives market also witnessed the entry of mutual funds in February 2020, marking a significant advancement in its outreach to retail investors.

As the commodity derivatives market is expanding, in terms of both products as well as participants, there is a need to focus and analyze in detail about the contemporary issues across the commodity value chain. Towards this objective, *Commodity Insights Yearbook*, a collaborative effort by MCX Investor Protection Fund (MCX IPF) and the National Institute of Securities Markets (NISM) is an attempt to create awareness and build knowledge base on the commodity ecosystem. This year onwards, the Yearbook focuses on one commodity segment under its *Emerging Trends* section, encompassing diverse aspects across the value chain of the selected commodity segment, through well-researched articles from domain experts.

Commodity Insights Yearbook 2020 focuses on 'Precious Metals' in the *Emerging Trends* section. The section provides analytical perspectives by eminent authors and researchers on various contemporary themes in this commodity segment. It includes a collation of research articles covering diverse aspects across the value chain of precious metals, with perspectives from domestic mining, refining, bullion banking and investing, while also emphasizing the need and pre-requisites for India to become price setter in bullion. The much-in-demand *Statistics* section of the yearbook, which is also available on downloadable spreadsheets on the website, continues to provide time-series data of all the major commodities for the benefit of researchers and analysts in the commodity ecosystem.

I hope the Yearbook continues to be the standard reference for commodity derivatives among investors, stakeholders and academia to gain proficiency and knowledge on this very important and rapidly evolving section of India's financial market.

**P. S. Reddy**  
MD & CEO



# INDIAN COMMODITY DERIVATIVES MARKET – OVERCOMING COVID-19 PANDEMIC

The Indian commodity derivatives market has shown strong resilience to the Covid-19 pandemic, recovering quickly from the initial shock following the nation-wide complete lockdown. The recovery was enabled by a vigilant regulatory system as well as resilient trading systems of the exchanges and other market intermediaries. The resilience and associated recovery was also supported by adequate liquidity in the financial system due to the accommodative monetary policies and a timely economic stimulus package from the government of India.

Globally, the precious metals segment has stood out strong, becoming the driving force behind the robust growth in commodity markets, as a safe haven investment option under extreme economic uncertainties resulting from the pandemic. Conversely, energy commodities, to a greater extent, and base metals, moderately, were affected by both supply and demand side disruptions resulting from the lockdown globally. According to the World Bank's *Commodity Markets Outlook October 2020*, the COVID-19 oil demand shock caused an estimated decline of about 10% in oil consumption during 2020 and could have a lasting impact.

Meanwhile, the nation-wide lockdown in India to contain the spread of the contagion resulted in a complete stall of all activities, significantly affecting economic growth. Consequently, Indian economy is expected to shrink by about 9.5% in 2020-21 according to the RBI's *Monetary Policy Report October 2020*. Further, the lockdown curtailed the demand and disrupted the supply chains of almost all commodities, creating major challenges for

commodity market operations.

Nevertheless, overcoming the grim economic conditions and the physical market challenges resulting from the pandemic and lockdown, the commodity derivatives market recovered quickly with the resumption of normal working hours and seamless trading operations. This was enabled, to a large extent, by the exchanges' and clearing corporations' robust trading and risk management systems with efficient business continuity plan that facilitated quick adaptation and recovery of market operations. Despite the lockdown, the exchange platforms witnessed significant amount of deliveries with around 4,186 tonnes and 8,946 tonnes of base metals being delivered through the MCX platform in April and May 2020 respectively.

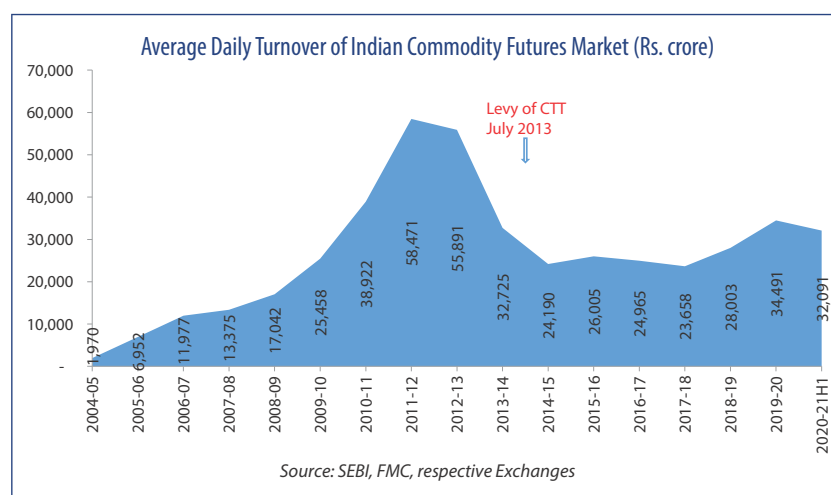
Furthermore, despite the prevailing pandemic and restrictions, the commodity derivatives market witnessed successful launch of new products, namely, options in goods

and index futures, further affirming the resilience of the market institutions.

## Sustaining Growth Momentum

The growth of India's commodity derivatives market during the Covid-19 pandemic, April onwards, followed a strong growth momentum witnessed in the year ending March 2020.

**Futures:** The average daily turnover (ADT) of commodity futures on Indian exchanges posted a robust growth of about 23% to Rs.34,491 crore in 2019-20, the highest since 2012-13, from Rs. 28,003 crore in the year before. The aggregate value of commodity futures traded across all exchanges increased to Rs.89.3 lakh crore from Rs. 71.97 lakh crore in the corresponding years. Notwithstanding the economic uncertainties arising from the lockdown due to Covid-19, commodity futures trading retained its strong performance with an ADT of Rs. 31,135 crore in the first half of the current financial year on MCX. Remarkably, even in the period marked



by lockdown-related restrictions, Indian exchanges launched futures contracts on commodity indices. MCX launched futures on the MCX iCOMDEX Bullion Index (MCX BULLDEX) and Base Metal Index (MCX METLDEX) on August 24 and October 19 respectively, while NCDEX launched the Agridex Index

futures on May 26 this year.

**Options on futures:** Trading in options on futures also recorded a steep growth of about 60% in their ADT to Rs. 1127 crore in 2019-20 from about Rs. 705 crore in 2018-19. However, trading in this segment moderated to an ADT

of about Rs. 908 crore in the first half of current financial year plausibly due to the Covid-19 and the introduction of options in goods. Commodity-wise share of ADT on MCX, which accounts for more than 99% of market share in options on futures, is presented in Table 1.

Table 1: Trends in ADT of Options on Futures traded on MCX

	CY2019	Share (%)	CY2020#	Share (%)
Copper	66	0.06	794	1.01
Zinc	8	0.01	750	0.95
Gold	70547	58.90	37186	47.11
Silver	13204	11.02	6122	7.76
Crude Oil	33930	28.33	34086	43.18

# till October 2020 CY Calendar Year

**Options in Goods:** Following approval from the regulator, options in goods with physical commodity as the underlying were launched in Bullion by BSE, NSE and MCX during June - July 2020. Subsequently, options in goods were also launched for agricultural commodities including chana, soybean, guarseed and guar gum on NCDEX. The ADT of options in goods across all exchanges stood at Rs. 2,756 crore as at the end of September 2020.

**Initiatives to arrest economic effects of Covid-19**

Following the declaration of nationwide lockdown from March 25, 2020 by the Government of India in response to pandemic Covid-19, a number of initiatives were taken to prevent the lockdown from having any major deleterious effect on functioning of the commodity derivatives market and its ecosystem.

**A. Measures by the Market Regulator**

**(i) Relaxation in adherence to prescribed timelines:** SEBI relaxed timelines for compliance with regulatory requirements by trading members / clearing members and also relaxed time period for certain activities carried out by Stock brokers.

**(ii) Facilitating KYC through online process:** SEBI allowed use of technological innovations which could facilitate online KYC.

**B. Measures by Exchanges/ Clearing Corporations**

The health crisis and lockdown has

led to unprecedented volatility in commodity prices, inability of brokers to operate with full staff and other supply disruptions. To address these challenges and ensure seamless trading, exchanges have taken the following measures:

**(i) Operational and Business Continuity Measures**

- Dedicated teams of employees have been stationed at Exchange premises, and at Disaster Recovery sites, to ensure that there is no disruption in trading or clearing.
- Other than a select group of employees performing critical exchange operations, all other employees have been discharging their functions working from home through virtual private network (VPN).
- Members have been allowed to operate Trader Work Stations (TWS) from anywhere.
- TWS User ID charges have been waived for up to 5 User IDs by MCX
- MCX developed an online system for generating e-passes and relaxed compliance-related timelines.
- Educational and awareness initiatives for investors are being continued through webinars.

**(ii) Levy of additional margins under extreme volatilities:** The extreme price movements in some commodities made clearing corporations to undertake additional risk management

measures by introducing additional and slab-based margins.

**(iii) Deployment of software supporting Negative Price:**

Exchanges have taken measures for supporting negative bid and ask prices, including zero price, in their systems, following the unprecedented movement of Crude Oil prices to negative values.

**C. Measures by the Government of India relevant for commodity markets**

The government of India announced a special economic package of Rs 20 lakh crore, which is equivalent to 10% of India's GDP, to stimulate growth and promote domestic production as well as trade capabilities towards its Atmanirbhar Bharat campaign. Additionally, the government has also announced a number of policy measures to boost agricultural production and productivity. These measures include:

**(i) Concessional Credit Boost to farmers:** Farmers to be provided institutional credit facilities at concessional rates through Kisan Credit Cards. This scheme will cover 2.5 crore farmers with concessional credit worth two lakh crore rupees.

**(ii) Agricultural Infrastructure Fund:** A fund of one lakh crore rupees to be created for development of agriculture infrastructure projects at aggregation points and farm-gates, where buyers can directly purchase produce from the farmers

**(iii) Emergency working capital for farmers:**

An additional fund of Rs 30,000 crore to be released as emergency working capital for farmers, primarily for meeting their crop loan requirements. This fund is expected to benefit three crore small and marginal farmers. This is in addition to the financial support of Rs 90,000 crore that will be provided by NABARD to rural financial institutions to meet the crop loan demand this year.

**(iv) Agricultural marketing and trade reforms:**

To promote agriculture as a sustainable enterprise, the

Government of India announced three landmark reforms on June 5, 2020.

1. The Farmers' Produce Trade and Commerce (Promotion and Facilitation) Ordinance, 2020
2. The Farmers' (Empowerment and Protection) Agreement on Price Assurance and Farm Services Ordinance, 2020
3. The Essential Commodities (Amendment) Ordinance 2020

These ordinances later received parliamentary approval and became Acts.

Measures, such as the above, have helped contain the pandemic-related lockdown and restrictions from having any major cascading effect on the commodity market, especially in the derivatives trading. The continuity and sustained growth of the market amidst the challenge posed by the pandemic and lockdown, also showed its inherent resilience. This resilience and sustenance is a unique value proposition of the market institution, on the basis of which it shall continue to successfully weather future challenges and thrive in all times to come.

Intentionally kept blank

# **EMERGING TRENDS**

# Atmanirbhar Bharat Abhiyan and the Development of Agricultural Commodity Markets



**Mr. Jayant Nalawade**

*Former Chief Regulatory Officer*

*National Commodity & Derivatives Exchange Ltd. (NCDEX)*

*With over thirty five years' experience in the financial sector, which includes domain expertise of rural banking, priority sector lending and managing Treasury Operations at ICICI Bank Ltd. for ten years, Shri. Jayant Nalawade has gained rich knowledge of the financial markets. His tenure with NCDEX has given him in-depth understanding of the commodity market, its functioning, the inefficiencies of the present market infrastructure and the structural changes required to enable better engagement of farmers with the markets. As Chief Regulatory Officer of NCDEX he had the unique opportunity to provide key policy inputs to the government in setting up of the national market and various other measures aimed at development & strengthening of the commodity derivatives market.*

*As an active farmer engaged in agriculture and horticulture during his college days on his ancestral land, Shri Nalawade has passionate interest in the welfare and development of the Indian farmer. His remarkable journey from rural fields to the world of high finance gives him a unique perspective and requisite skills for bringing about the socio-economic transformation in the agriculture sector.*

*During his professional career he has also been a visiting faculty at Banker Training College, NIBM, IFMR and NISM.*

The COVID19 pandemic has severely affected life across nations requiring Governments to take remedial actions for protecting lives of people and for mitigating adverse impact on their economies. India declared a three-week nation-wide lockdown in the initial phase and extended it further for containment of the pandemic. The restrictions on movement of people raised concerns regarding the negative long-term implications on the farm economy. It being the harvesting stage of the *rabi* season, severe disruption in the food supply chain including perishable fruits and vegetables, dairy products, fish, etc. had the potential of causing irreparable damage to the underlying agricultural markets and the livelihood of farmers. The migration of workers to their native places also triggered panic, as they are crucial for both harvesting operations and post-harvest handling of produce in storage and marketing centers. The Government, therefore, in a very significant move, notified to exclude movement of farmers, farm labourers and harvesting and sowing-related machines from the purview of lockdown. Making the food grains, fruits and vegetables and other essential items available to consumers, both in rural and urban areas, with adequate safety measures for the people involved, was the most critical challenge for the Government during the lockdown.

After the nation-wide lockdown was announced, the Government immediately declared a Rs. 1.7 trillion package to protect the vulnerable sections of the population (including farmers) from adverse impact. The announcement, among a slew of benefits, contained advance release of Rs. 2000 to bank accounts of farmers as income support under PM-KISAN scheme, increase in the wages for workers engaged under the NREGS and

additional grain allotments for three months to registered beneficiaries. Cash and food assistance to persons engaged in the informal sector, mostly migrant labourers, were also announced for which a separate PM-CARES (Prime Minister Citizen Assistance and Relief in Emergency Situations) Fund has been created. The Reserve Bank of India (RBI) also announced specific measures to address the "burden of debt servicing" due to the pandemic.

Agriculture is a key sector of the Indian economy in view of its contribution to employment and GDP. The above initial measures being only short-term in nature, necessitated a more detailed approach and offered the Government a unique opportunity to reframe the existing food and agriculture policies to achieve a food systems transformation for attaining a sustainable growth in the farm sector.

**Atmanirbhar Bharat Abhiyan (ABA)**, the economic revival package announced by the Union Government, has its third tranche exclusively dedicated to agriculture and allied activities designed for making long-pending agricultural marketing reforms, with underlying objectives of facilitating better and predictable prices for farmers and thereby strengthening the agri sector. The measures include

- Working capital facilities for farmers;
- Enhanced procurement activities;
- Measures to strengthen infrastructure,
- Logistics, and capacity building;
- Governance and administrative reforms such as amendments to Essential Commodities Act,
- Agriculture marketing reforms,

- Quality standardization and price assurance and
- Additional support to allied activities.

#### **Agricultural Credit**

Agricultural credit plays a vital role in farm sector development and adoption of new technologies. However, credit even at the most reasonable rates, alone, cannot guarantee higher productivity or adequate income for the farmers as many other supporting factors such as the climatic conditions, availability of adequate agricultural inputs, services and remunerative markets for the produce play an even important role.

The agricultural credit policies designed and implemented in India are mainly supply driven through targeted ground level credit, interest subvention scheme and directed lending by way of regulatory prescription under Priority Sector Lending guidelines of the RBI. These policies along with other policy interventions by the Government and RBI have over the years yielded commendable results in the field of agricultural credit. However, the agricultural sector still faces challenges such as lack of capital formation, regional disparity, dependence of farmers, especially small and marginal farmers, on non-institutional sources of credit at significantly higher rates, non-realization of fair price for agricultural produce causing farmers' distress and farm loan waivers impacting credit culture and weakening state finances. In this regard the *Internal Working Group to Review Agricultural Credit (RBI 2019)* had earlier recommended that the Government should undertake a holistic review of the agricultural policies and their implementation, as well as evaluate the effectiveness of current subsidy policies with regard

to agri inputs and credit in a manner which will improve the overall viability of agriculture in a sustainable manner.

- The ABA measures, as announced, will augment credit flow through additional re-finance support of Rs 30,000 crore over and above the Rs 90,000 crore already being provided by NABARD for meeting crop loan requirement of Rural Cooperative Banks and RRBs.
- This will benefit 3 crore farmers, mostly small and marginal. Provision of concessional credit to PM-KISAN beneficiaries (including Fisherman and Animal Husbandry Farmers) through Kisan Credit Cards will inject additional liquidity of Rs 2 lakh crore to 2.5 crore farmers.
- Interest subvention @ 2% per annum to dairy cooperatives for 20-21 and additional 2% p.a. interest subvention on prompt payment / interest servicing will provide Rs 5,000 crore additional liquidity benefitting 2 crore farmers.
- The measures also include various relaxations to the fisheries sector to support production and exports.

#### Infrastructure Logistics

Agriculture markets and marketing can directly impact price realisation and livelihood conditions of farmers (*World Bank 2008*). There are more than 6,600 regulated wholesale markets (mandis) and 22,000 rural periodical markets in the country. The extent of market access and participation significantly varies across farmer categories. Empirical evidence suggests that access to storage facilities has a positive effect on the commercialisation of agriculture in India (*Kumar and Das 2020*) which is an important determinant of farm income and livelihood conditions of farmers. Currently access of farmers to warehouse facilities in India is limited. Access to warehouses largely depends on availability, location, quality, and storage capacity. A study by the National Institute of Public Finance and Policy found that traders were the main users of warehouses (*NIPFP 2015*).

#### Inadequate storage facilities

According to the latest estimates, organised warehousing capacity in the country is 155.42 million tonnes, of which about 50% of the capacity is in the private sector, the result of various schemes initiated by the Government to attract private investment in this sector. However, there still exists a wide gap between the availability and requirement for warehouses, projected as 196 million tonnes (about 70% of production) by 2020-21. Similarly, there is a huge gap in the availability of cold-

chain infrastructure, particularly pack-houses, reefer vehicles and ripening chambers. Besides the inadequate availability, distribution of warehouse capacity is highly skewed with excess or unutilised capacity in many states (*Chatterjee and Kapur 2016; Gol 2017*). More than 68% of the capacity with FCI is in the north zone, 90% of which is in just three states - Punjab, Haryana, and Uttar Pradesh.

#### Lack of modernization

Poor adoption of modern technology, for both storage and handling, poor availability of quality assessment facilities and lack of trained manpower are some of the other prominent challenges in agri-warehousing sector. In both physical and virtual markets, lack of credible assaying facilities and market infrastructure deter fair price discovery. Unfortunately, where assaying is implemented, neither traders nor farmers trust quality based on assaying; while traders feel that current assaying methods do not capture all aspects of quality, farmers feel that assaying can reduce their price realisation (*NABARD 2018*). Clarity on grades, standards and transparency in assaying are critical for objective price discovery that benefits both parties.

In this context, the ABA acknowledges that the focus till now has been on short term crop loans while investment in long term agriculture infrastructure has often been not enough. The financing facility of Rs.1,00,000 crore for funding Agriculture Infrastructure Projects at farm-gate & aggregation points (Primary Agricultural Cooperative Societies, Farmers Producer Organisations, Agriculture entrepreneurs, Startups, etc.) is a significant policy initiative. This should give impetus for the development of farm-gate & aggregation point, affordable and financially viable Harvest Management infrastructure. A step in the right direction was already taken with the introduction of warehouse-based sales, which will encourage scientific management of warehouses and facilitate remote purchase of produces. Virtual market infrastructure in rural areas can help farmers/ farmer organisations reach retail chains, and facilitate direct sales, particularly for fruits and vegetables and small volume commodities. It can also mitigate information asymmetry to a great extent and can help provide expert advisory to the farmers.

#### Capacity Building

The ABA includes Rs. 10,000 crore scheme for formalization of Micro Food Enterprises (MFEs) to address the need of the MFEs in the unorganized sector for technical upgradation to

attain FSSAI food standards, brand building and marketing. This will help ~ 2 lakh MFEs to attain the much desired goals. Simultaneously, existing micro food enterprises, Farmer Producer Organisations (FPOs), Self Help Groups (SHGs) and Cooperatives are sought to be supported. This will improve health and safety standards, facilitate integration with retail markets and should help in reaching untapped export markets thereby improving incomes in the sector.

Under the ABA the Government also announced launch of the Pradhan Mantri Matsya Sampada Yojana (PMMSY) for integrated, sustainable, inclusive development of marine and inland fisheries comprising Rs 11,000 crore for activities in Marine, Inland fisheries and Aquaculture and Rs. 9,000 crore for Infrastructure – Fishing Harbours, Cold chain, Markets, etc. to address the critical gaps in fisheries value chain. This is expected to lead to additional fish production of 70 lakh tonnes over 5 years, employment to over 55 lakh persons and double exports to Rs 1,00,000 crore.

The Animal Husbandry Infrastructure Development Fund of Rs. 15,000 crore under the ABA shall support private investment in Dairy Processing, value addition, cattle feed infrastructure and for giving incentives for establishing plants for export of niche products.

The National Medicinal Plants Board (NMPB) has supported 2.25 lakh hectare area under cultivation of medicinal plants and the ABA proposes that 10 lakh hectare will be covered under Herbal cultivation in next two years with outlay of Rs. 4,000 crore which will lead to Rs. 5,000 crore income generation for farmers with the setting up of network of regional Mandis for Medicinal Plants. The Government will also implement a scheme for infrastructure development related to Integrated Beekeeping Development Centres, Collection, Marketing and Storage Centres, Post-Harvest & Value Addition facilities, etc. and capacity building with thrust on women. This will lead to increase in income for 2 lakh beekeepers and making available quality honey to consumers.

India ranks among the top countries in the world in production of a number of crops. It being trade-surplus on commodities like rice, meat, milk products, tea, honey, horticultural products, etc. can now seize the opportunities by exporting such products with a stable agri-exports policy. India's agricultural exports were valued at USD 38 billion in 2018-19 and should certainly rise further with the conducive policies.



## Agriculture Market Reforms

Agriculture markets in India have been regulated through the legal framework of Agricultural Produce Market Regulation Act (APMRA). The Act mandates sale/ purchase of agricultural commodities notified under it to be carried out in specified market areas, yards or sub-yards under the supervision of APMC. One of the stated objectives of regulated wholesale markets (mandis) is to protect farmers, through a mechanism for fair price discovery, from exploitation from intermediaries. These mandis provide a platform for the farmers to sell their produce under a defined legal framework. They provide opportunity for price discovery and price information based on aggregate demand and supply. In the absence of mandis, getting a reference price will be difficult. Empirical evidence shows that farmers who sell in informal markets receive significantly lower prices compared to those who sell in mandis (Negi et al 2018). This gives credence to the argument that well-regulated agriculture markets are important to address market failures (Purohit et al 2017).

It has now been accepted that the APMC system has failed to deliver on the objectives of controlling prices or addressing market imperfections as the APMC mandis do not have transparency in price formation process, create virtual oligopolies of the local traders and are also criticised for rampant corruption. There is wide variation in the effectiveness with which regulated markets perform in the country. The present status and organisation of agriculture markets demand drastic reforms to make them relevant and efficient. This has been re-emphasised in the ABA and the restrictive nature of mandis that hinder remunerative price realisation for farmers has been highlighted. The ABA proposes to reform the agriculture markets by formulating a Central law to provide adequate choices to the farmer to sell produce at fair price, barrier-free interstate trade and a framework for e-trading of agriculture produce. The ABA also recognizes the urgent need to create scientific and quality agri warehousing infrastructure with modern facilities across the country, along with strengthening of various other agri-logistics elements, including marketplaces, market-level infrastructure, quality assessment facilities and transportation.

Cognizant of the need to address the long-term challenges of the agricultural sector, various policy measures such as crop insurance, income support scheme, the Essential Commodities

Act (ECA) and state level Agricultural Produce Marketing Committee (APMC) reforms and e-NAM, etc. have been undertaken earlier at various levels of the government. In view of the inefficiencies of the present market infrastructure, structural and legislative changes to promote private investment and participation in agriculture, to enable better engagement of farmers with markets, was recommended for some time.

The Model APMC Act, 2003 liberalized agricultural marketing in the country by providing more opportunities for the farmers to sell their produce and legalised new marketing channels such as direct sales, private markets, and contract farming. Further, great impetus is now being given to promoting farmer producer organisations (FPOs) which reduce transaction costs for small and marginal farmers. FPOs have the potential to compensate, to a great extent, the poor endowments of smallholder farmers by providing economies of scale. Based on the successful Karnataka model, electronic National Agriculture Market (e-NAM) was launched with the objective of creating a nationwide, unified market to mitigate information asymmetry in traditional markets. Its mission is to integrate APMCs across the country through a common online market platform to facilitate pan-India trade in agriculture commodities, providing better price discovery through transparent auction process based on quality of produce along with timely online payment.

### Way Forward

The growth of agriculture and allied sector has a significant role in the overall growth of Indian economy. The reliance on policy of market intervention and stabilization of agricultural commodity market should now shift towards policies that emphasize on the management of the concerned risk through market-based instruments. Prices of agricultural commodities are determined by market forces of demand and supply. With the substantial growth in the production of principal crops in India over the last two decades, it is very important to strengthen futures and other forms of derivatives trading in all commodities vulnerable to large and erratic price fluctuations to mitigate the price risk for agri-business. While India has a long history of futures trading in commodities - even preceding the advent of futures trade in other asset classes such as stocks and currencies - the long enforced ban

on futures trade stymied the growth of these markets in India. Commodity exchanges actually serve a vital role to the economy and it is unlikely we would have had as much global economic growth in the last 100 years without the commodity exchanges. The purpose of commodity exchanges is to provide a centralized marketplace for all value chain participants related to the commodity with instruments for managing the inherent price risk. This increases business survival among market participants.

Commodity exchanges, being national online markets, ensure an integrated price structure across the country and also iron out the supply-demand imbalances throughout the year. The commodity derivatives markets act as a focal point for the collection and dissemination of price statistics that provide vital signals to all market players, policy makers and the government. The availability of commodity prices as on some future dates makes the underlying physical market more strong and vibrant. An integrated system of spot, forward and futures market enhances the credibility of price discovery process and in turn attracts more participants in the futures market, particularly corporates/hedgers for managing their price risk. Small farmers and growers benefit through the price signals emitted by the futures markets even if they may not directly participate in the futures market by taking advantage of the advance information of the future price trends of alternate crops. By providing the manufacturers and the bulk consumers a mechanism for covering price-risks, the futures market induces them to pay higher price to the farmers, as the need to pass on the price-risk to them is obviated.

The growth and development of the commodity derivatives markets is inextricably linked to the integrated and well developed underlying physical markets. Also, for a vibrant commodity derivatives market, the underlying cash market of commodities should be geographically integrated and free from Government restrictions on production, marketing and distribution, like limit on stockholding and movement of goods across state borders and that the differential inter-state tax structure as well as the laws introduced by various State Governments restraining direct purchase from farmers.

Quite appropriately, the ABA proposals have acknowledged some of the most urgent concerns of agriculture sector and have come at an opportune time for the development of commodities markets in India. The Bills pursuant

to the ABA proposals have since been passed by both the houses of Parliament. The fact that the three Acts have been enacted together signals the right intent for reforms and is indeed reassuring.

'The Farmers' Produce Trade And Commerce (Promotion And Facilitation) Act, 2020' has provisions for greater flexibility in establishing trade areas for sale and purchase of agricultural commodities, removing barriers to interstate and intrastate trade, and doing away with cess/ levy for farmers and licences for traders aimed to benefit both farmers and traders. Traders will now be encouraged to invest in supply-chains and agri-businesses. The scrapping of the ECA-APMC system enables localised decision-making by farmers even as they can participate in

a national common market or export to the global market.

'*The Essential Commodities (Amendment) Act, 2020*' focuses on removing restrictions on stocking food produces to shore up supply through market forces and facilitate better price realisation for farmers, price stability, the larger flow of investment in the farm sector. It thus seeks to increase competition in the agriculture sector and enhance farmers' income, thereby aiming to liberalise the regulatory system while protecting the interests of consumers.

'*The Farmers (Empowerment and Protection) Agreement On Price Assurance and Farm Services Act, 2020*' provides for a national framework on farming agreements that protects and

empowers farmers to engage with agri-business firms, processors, wholesalers, exporters or large retailers for farm services and sale of future farming produce at a mutually agreed remunerative price framework in a fair and transparent manner.

The ABA has thankfully addressed the long awaited pre-requisites for development of a vibrant nationwide market and should encourage the private sector for the development of modern export-supportive infrastructure and logistics that will serve the long term interests of the farmer as well as the Indian economy. The government shall now assume the role of an enabler, providing soft and hard infrastructure.

## REFERENCES

- Chatterjee S and D Kapur (2016): "Understanding Price Variation in Agricultural Commodities in India: MSP, Government Procurement, and Agriculture Markets," India Policy Forum, pp 12–13, July.
- GoI (2017): "Post-production Interventions: Agricultural Marketing," Report of the Committee on Doubling Farmers' Income, Department of Agriculture, Cooperation and Farmers' Welfare, Ministry of Agriculture and Farmers' Welfare, Government of India, Vol IV.
- Kumar, A G and V K Das (2020): "Do Storage and Structural Factors Determine Agricultural Commercialization in India," Working Paper No 2020-004, Indira Gandhi Institute for Development Research, Mumbai.
- NABARD (2018): "Status of Marketing Infrastructure under Electronic National Agriculture Markets: A Quick Study," Mumbai: National Bank for Agriculture and Rural Development.
- Negi D S, P S Birthal, D Roy and M T Khan (2018): "Farmers' Choice of Market Channels and Producer Prices in India: Role of Transportation and Communication Networks," Food Policy, Vol 81, pp 106–21.
- NIPFP (2015): "Report on Warehousing in India: Study Commissioned by the Warehousing Development and Regulatory Authority," New Delhi: National Institute of Public Finance and Policy.
- Purohit P, K S Imai and K Sen (2017): "Do Agricultural Marketing Laws Matter for Rural Growth? Evidence from the Indian States," Discussion Paper, DP 2017–17, RIEB, Kobe, Japan: Kobe University.
- RBI (2019) Internal Working Group to Review Agricultural Credit, Reserve Bank of India, Mumbai.
- World Bank (2008): World Development Report 2008: Agriculture for Development, Washington, DC: World Bank.

# **EMERGING TRENDS**

Special Focus: Precious Metals

# Precious Metals – Prospects, Issues and Perspectives

India's fascination for precious metals, particularly for gold, dates back to ancient times. Precious metals, that is gold and silver, have been extensively used both as an ornament with high cultural importance and representing prosperity, as well as an investible asset protecting against inflation and against risks arising from economic uncertainties, debt crises or political tensions. These properties of precious metals are as relevant today as they have been over the past hundreds of years. The current pandemic Covid-19 has, once again, reinstated the safe haven status of precious metals with investors across the world increasingly choosing to hold them in their portfolios. The resultant surge in demand led to rise in gold and silver prices to record high levels following the outbreak of Covid-19.

While precious metals have long been used as an investment-worthy asset class, the evolution of modern financial markets has provided opportunities for emergence of new and easier ways to invest in these metals. Several financial instruments have emerged overlying gold and silver, which not only provide easier access to invest in these commodities, but also help to financialize their values and thereby provide a host of economic benefits. For instance, gold loans (working capital or term loans against gold) is a testimony to this kind of unlocking of economic value offered by the banking industry for long.

A few other financial instruments overlying precious metals, especially gold, include the following:

- **Exchange Traded Funds (ETFs):** These are securitized investments, backed fully by equivalent amounts of gold or silver. They are regulated financial products and track the gold/ silver price almost perfectly.
- **Gold-oriented funds:** Some mutual funds specialize in investing in the shares of gold mining/ related companies and other gold-related instruments. These are regulated products and differ in their structure - some may invest in the shares of gold mining companies, others may invest in futures or equities of gold-related companies or even in the underlying metals.
- **Gold warrants:** Commonly used by international investment banks, these instruments give the buyer the right to buy gold at a specific price on a specific day in the future. For this right, the buyer pays a premium.
- **Bullion accounts:** These accounts are maintained by bullion banks or entities similar as these, where depositors hold real or notional gold/ silver deposits. Such accounts may also offer Gold Accumulation Plans (GAPs) where depositors invest a fixed sum of money every month, or accumulate a fixed amount of the metals every month.

Apart from the above, financial products on precious metals could also include a variety of derivative instruments – either exchange-traded or Over the Counter (OTC). OTC products could include forwards, swaps or Structured Notes which allocate part of the sum

invested to purchase options, the other part being invested in the money market. The commonest exchange-traded derivatives are futures and options on precious metals. In India, exchange-traded futures and options on precious metals have emerged as one of the most tracked instruments for benchmarking prices in the larger market for precious metals.

Futures and options have also become popular in India as an effective way for managing the price risks associated with these commodities. India is world's second largest gold consumer and imports on an average around 750 tons of gold, as witnessed in the past five years. Imports account for about 80% of the domestic consumption demand. Similarly, India is also one of the major consumers of silver and imports around 5601 tons on average, which is close 90% of total domestic supply of silver. Such a scenario results in percolation of international price volatilities to domestic markets, exposing the domestic consumers to the resultant price risk. Stakeholders across the value chain have been using futures and options to protect themselves from the price risk arising from uncertainty and volatility in bullion prices.

Although derivatives trading on electronic exchanges with nationwide reach arrived in India in 2003, the country has a long history of trade in bullion derivatives, dating to at least a century with the formation of the Bombay Bullion Association in 1919. Modern derivative trading in precious metals evolved over the last seventeen years and gold/ silver futures price today

is considered an important benchmark for price setting in gold or silver in any part of the country. While futures contracts on gold and silver were the first instruments to be launched among bullion derivatives, Options on the futures of these metals were launched in 2017. Meanwhile, futures contracts of multiple size variants of gold and silver were also available in the Indian market. By 2020, Options on physical gold, as well as futures on a bullion index were also launched. Thus, Indian exchanges today offer a wide range of derivative products on precious metals suitable to the requirements of multiple stakeholders in the ecosystem of these metals.

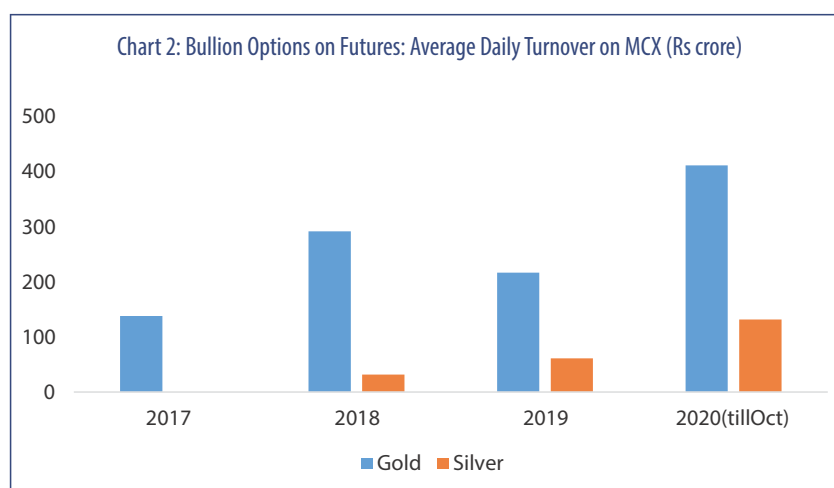
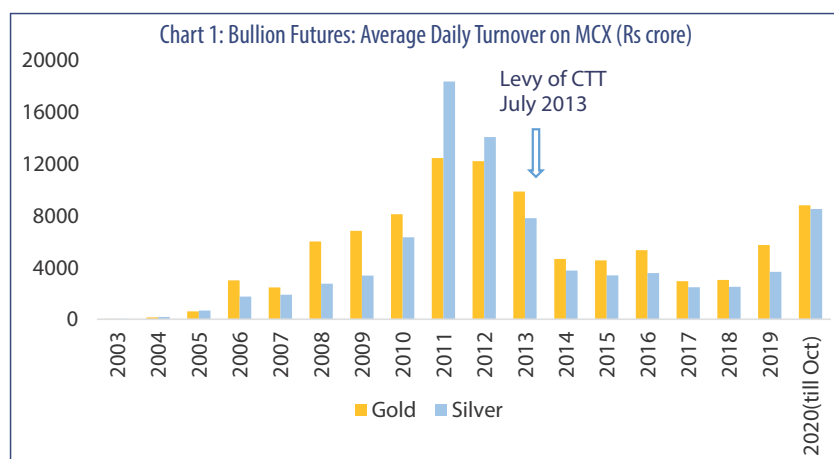
The Average Daily Turnover in the futures and options of precious metals on MCX, the dominant exchange for these two metals, can be seen in Charts 1 and 2

Thus, precious metals, especially financial instruments that ride on them, have been providing their holders avenues for investment, collateral for capital and tool for risk management. The flow of these economic benefits can be further enhanced with a few policy reforms.

The first of these policy reforms necessitate opening up derivatives trade to all types of financial institutions, including banks and insurance companies. Like other participants, these institutions also need to be provided the benefit of risk management and/or high risk-adjusted returns that bullion derivatives offer. Secondly, Commodity Transaction Tax (CTT) needs to be either removed or reduced from bullion derivatives. This tax, the like of which is not prevalent anywhere in the world, is today the single largest component in the cost of

transaction in bullion futures or options. It inhibits large scale participation and erodes India's competitiveness.

Thirdly, policy action is needed to encourage Indian bullion refiners to upgrade standards to match world standards. For enhancing public faith in Indian bullion and popularize global trade in precious metals refined in India, policy encouragement is required to enhance the quality standards of Indian refined gold and silver. This will go a long way in making India a global trading hub for precious metals. The fourth area for policy action relates to mining of gold and silver. Appropriate policies are needed to encourage commercial exploration of gold mines on a sustainable basis, on the lines of similar policies for hydrocarbons or mineral ores, so that dependence on imports for satiating domestic demand for gold and silver can be decreased.



Another area of policy action needed is in creating the legal and regulatory framework for launching a spot exchange for bullion. In an economy with old, strong and organic links with precious metals – both in the physical and financial markets, the absence of a regulated spot exchange platform is rather glaring. A spot exchange platform with liberal rules for participation and products will lead to the creation of the most widely accepted national benchmark for bullion prices, with the possibility of ultimately leading to emergence of an 'India Price' even for international transactions on the lines of 'London Fix'.

The above are some of the prospects and issues in the market for precious metals in India today. The year's *Emerging Trends* section of this Yearbook features special articles focusing on these and many other contemporary issues associated with the entire value chain of precious metals. It is hoped that these prospects and issues form part of the greater dialogue happening across different stakeholders of India's bullion market, which can contribute to unleashing the potential of this market and providing its stakeholders a host of economic benefits in a sustained manner.

# Gold as an Asset Class for Investment



**Dr. Latha Chari**  
*Associate Professor,  
NISM*



**Dr. Pradiptarathi  
Panda**  
*Assistant Professor,  
NISM*



**Dr. V.R. Narasimhan**  
*Dean, NISM*

*Dr. Latha Chari is a Doctorate in Finance from BITS Pilani, Post Graduate in Commerce and an FCMA (Fellow Member of the Institute for Cost Accountants of India). She has an experience of about two decades equally divided between academia and industry. Before joining NISM, Dr. Chari has worked with the Institute for Technology and Management and ITM Institute of Financial Markets for more than a decade and was the Deputy Director of the institute. During her academic tenure, she has published papers in various national and international journals. She has conducted MDPs in the areas of financial asset valuation, strategic cost management, trading and operations in equity markets, performance evaluation of mutual funds and the like. Dr Chari's areas of research interests include strategic cost management, corporate valuations, market microstructure, shareholder value enhancement and similar studies. She has special interests in establishing finance labs and in design, development and delivery of lab-based courses in the areas of banking and financial markets.*

*Dr. Pradiptarathi Panda is working as an Assistant Professor at the National Institute of Securities Markets (NISM) established by SEBI. Prior to the current position, he has worked as a Lecturer and Research Associate of NISM. Dr. Panda was a Research Scholar of the Indian Institute of Capital Markets (IICM) and is having more than seven years of teaching and research experience. He holds a Master's in Finance & Control (MFC) from Berhampur University, an M.Phil. in Finance from Pondicherry Central University and Ph.D. in Finance from the University of Mumbai and a UGC NET qualified Candidate. His teaching interests are Financial Institutions and Markets (FIM), Applied Financial Econometrics, Financial Computing using R and Python, Financial Derivatives, Global Financial Markets, and Trading in equity and derivatives. He has published a number of research papers in ABDC and Scopus indexed journals. He has worked in the areas of volatility spillovers, equity markets, derivatives markets, interest rate futures, green bonds, market microstructure, circuit breakers, Ownership structures, and so on. He is currently a member of the editorial board for several journals and a reviewer for a number of journals along with World Finance Conferences.*

*Dr V.R. Narasimhan is having 40 years of work experience in Financial and Capital Markets in India. He started his career as a lecturer. After that, he joined AP State Finance Corporation (APSFC) and worked for about 11 years. In 1992-1993 he joined Capital Market Regulator – SEBI as Division Chief, Secondary markets. At SEBI he was in charge of Broker Registration, an inspection of Stock Exchanges and also worked on drafting regulations for custodians and depositories. In 1996, he joined India's first securities depository viz., National Securities Depository Limited (NSDL) and worked with it for ten years. In 2006, he joined Kotak Mahindra Group and played multiple roles including setting up Kotak Mahindra Pension Fund Company, setting up Kotak Commodity Derivatives Exchange, Group head for capital market compliance etc. In 2013 – the year in which the SEBI regulations for stock exchanges and clearing corporations was made effective (SECC Regulations) - he joined as the first Chief Regulatory Officer of National Stock Exchange and retired from that position in April 2018. As a member of the Institute of Company Secretaries of India, he plays an active role in the academic activities and contributed articles to their professional journal.*

*Dr. Narasimhan is a post-graduate in Commerce, MBA (Finance) and a Ph.D. Currently, he is the Dean of National Institute of Securities Markets (NISM) established by SEBI.*

*This article attempts to trace the history of Gold as a precious metal, its transformation into currency and further evolution into a financial asset class. In the past decade, various gold-based investment products are introduced into markets like Gold ETF and Sovereign Gold Bonds. The article covers the advantages and risks related to these emerging investment opportunities. Gold as an asset class for investment – either as direct investment or as a reference for value accretion will continue to stay. So long as the Gold glitters as an asset class, derivative trading in Gold will flourish.*

## History of Gold

The ancient civilisations mined Gold for its grandeur, ease of use and ability to transform it into different forms easily. Gold was a symbol of wealth and was used as a store of value. The Reuter article "Timeline- Golds history as a currency standard" mentions that Egyptians were the first to use gold as

a currency and medium of exchange in the year 1500 BCE. The documented history suggests that in India, the first gold coin was minted by the Kushan King Kanishka I in 127 CE. Later rulers of different dynasties like the Mauryas and Guptas are said to have issued both gold and silver coins regularly. However, there are ample references to Gold and gold jewellery in Indian

Mythology. Various other nations like Rome and Britain were also using both Gold and silver as currency and medium of exchange by 1200 AD. Thus, Gold had transformed itself from precious metal and ornament, to store of value and medium of exchange. In 1792 AD, the United States of America began the silver-gold standard monetary system, where dollar value was pegged to the

value of Gold and silver. Otherworld currencies also pegged the value of their currency in terms of gold value. The balance of payments in international trade transactions was made through the exchange of Gold.

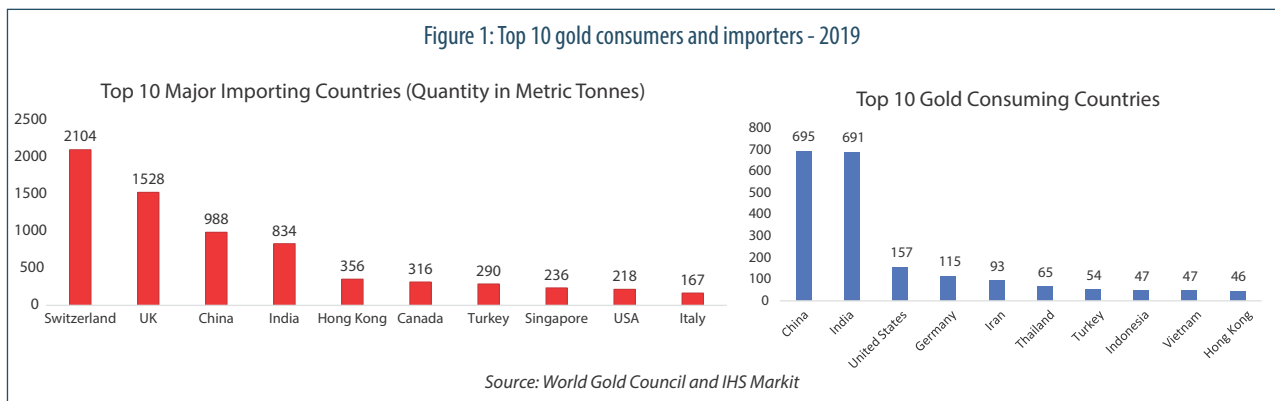
Failure of the gold standard system and introduction of Bretton woods system disconnected Gold from its role as a medium of exchange. The Bretton Wood System collapsed between 1971 and 1973. A key reason for Bretton Woods' collapse was the inflationary monetary policy that was inappropriate for the key currency country of the system. The Bretton Woods system was based on rules, the most important of which was to follow monetary and fiscal policies consistent with the official peg. The collapse of the Bretton Woods system led to the adoption of a managed floating exchange rate system by most

countries. This marked the end of the era where Gold played an essential role as currency or in determining the value of the currency of different countries. While the value of the US dollar was pegged to the value of Gold, all other countries agreed to peg their currency value to the value of the US dollar. Thus, the US dollar assumed the role of world currency.

**Gold as an Investment asset**

Despite the above changes, individuals and households continued to invest in Gold as Gold was regarded as an appreciating investment that created and preserved wealth. Further investment in gold ornaments also had use-value. Households in India have been investing in gold jewellery and coins for many centuries. Indian households have a long history of investment in Gold. The private

household gold holding in India as in 2017 was estimated at 24000 Metric tons and valued at US\$ 800 Billion (World Gold Council 2017). Though India is not among the top producers of Gold in the world as of today, India has been among the largest consumers of Gold and importer of Gold. Figure 1 shows the top 10 producers and importers on Gold in the world in the year 2019. An essential factor contributing to growth in gold consumption in India is good economic growth translating to higher disposable incomes in the past decade. Also, Indians are habituated to buying Gold on various festive occasions and gifting Gold is part of Indian culture. However, high imports of Gold adversely affected the current account deficits. Gold was the second largest commodity in the import basket of India during the year 2012-13, contributing significantly to current account deficit.



In order to disincentivise the import of Gold, the government of India came out with various trading and administrative curbs and increased duty on gold imports, which resulted in fall in the prices of Gold and also fall in imports. Figure 2 presents the data on prices of Gold in the past 15 years.

As per the report by Niti Ayog (2018), the above interventions of the government helped in improving the utilisation of

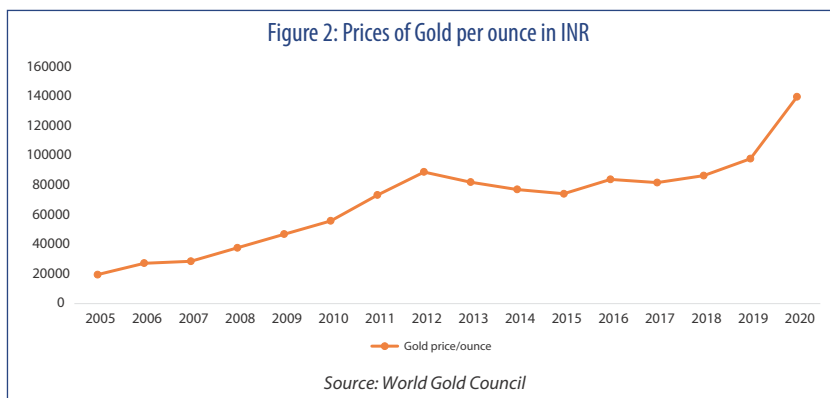
Gold for more productive purposes. The 5-year average data from 2012 to 2017 showed that 80% of gold imports were used in Jewellery industry, 2.5% in ETF, 1.4% by industry and 16.1% in bullion for investment. The government also launched various other investment schemes like Sovereign Gold Bonds in order to facilitate investments in securities that aimed at providing returns similar to an investment in Gold. SEBI permitted the launch of Gold

ETFs, which also facilitated investors to take exposure to Gold as an asset class without having to directly invest in Gold.

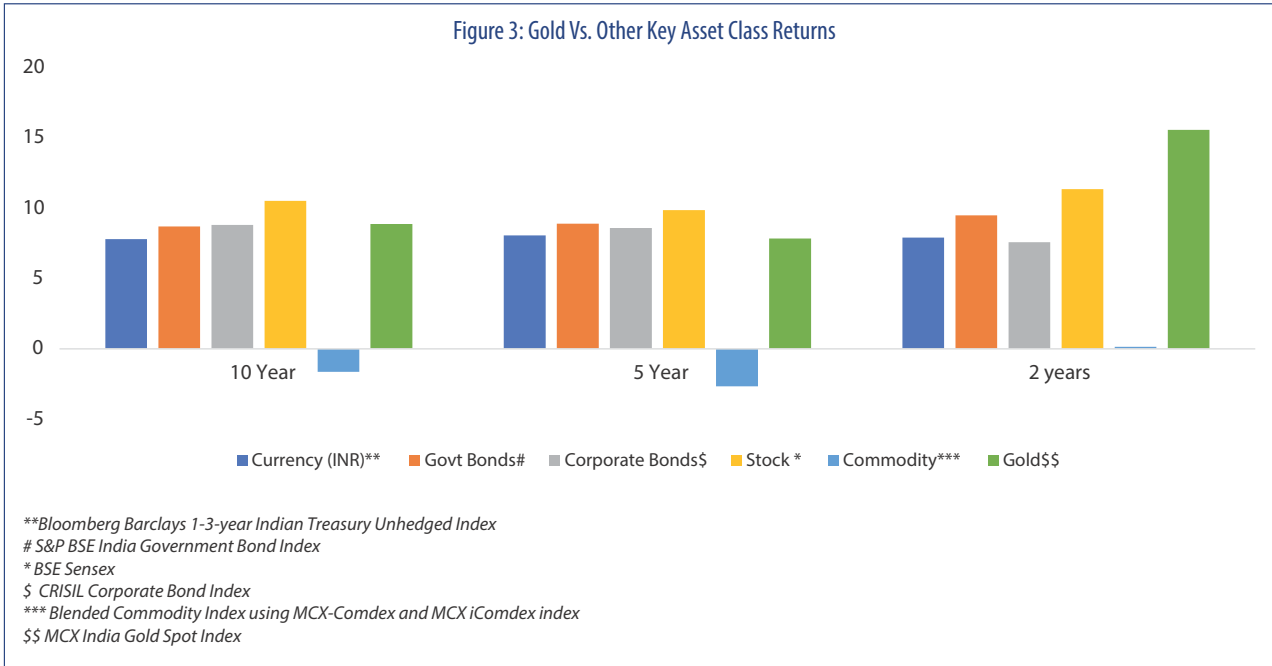
**Investments with Gold as underlying:**

The introduction of alternate gold-based investment schemes started gaining market share both in India and globally. Gold ETF was first introduced in India in the year 2007, and Sovereign gold bond scheme was introduced in the year 2015. During the same period, the investments into equities and mutual funds were also aggressively promoted as asset classes that had the potential to provide better returns than traditional investments like bank deposits, post office saving schemes, and corporate deposits.

Gold as an asset class has again gained prominence in the year 2020, driven by concerns like economic downturn and global recession owing to Covid Pandemic. Most economies have registered a fall in Gross Domestic







Product, and returns across different asset classes have fallen during the year 2020. Low-interest rates combined with high volatility in the equity markets lead to renewed interest in Gold as a defensive and safe investment option. Continuing financial market uncertainty, geopolitical cross border tensions and non-availability of reliable data related to an economic revival, make Gold a more relevant investment in current times. As per the report by World gold council, Gold has given superior returns as compared to US dollars, US Bonds and Commodities and provides returns as good as US stocks and Emerging market stocks. In India, Gold has outperformed other asset classes like corporate bonds, government bonds, and the Indian currency over a period of 2-10 years on a compounded return basis and compares reasonably with equity returns in the country, as shown in Figure 3.

The price of Gold per ounce has shown a consistent increase over the long period of 15 years, as shown in Figure 2. The value of gold has increased from Rs. 24500 per ounce to Rs. 140000 per ounce, which is about 5.71 times. Further, from figure 2, it can be seen that annual return on Gold has been consistently increasing and positive except for the years 2013-2015, driven by policy changes. Historically, it is seen that returns on Gold are inversely proportionate to returns on equities. This makes Gold a viable alternative for investors to diversify their portfolios and reduce risk and maximise returns. Based on the above changes in the global and

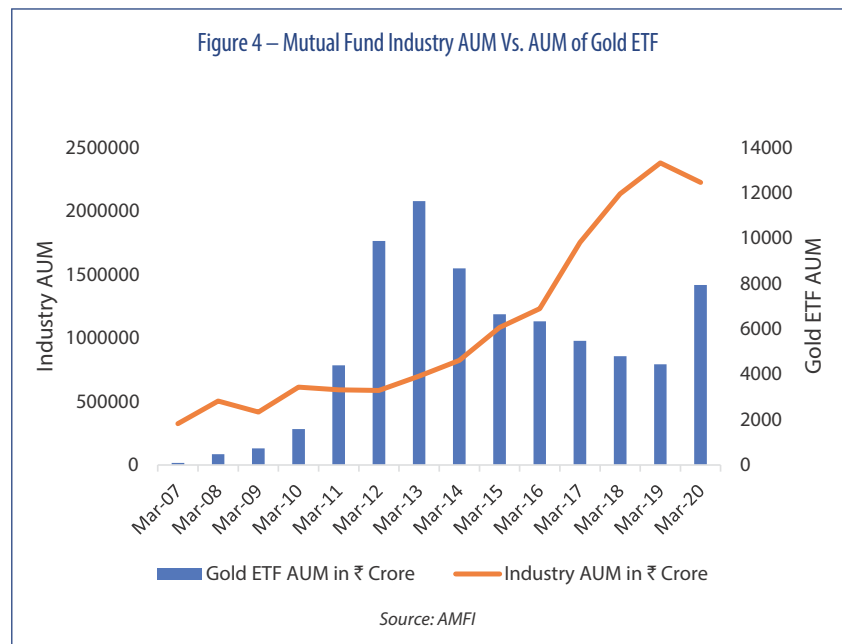
Indian economy, Gold has emerged as an attractive investment opportunity for investors.

Though gold ETF and Sovereign Gold bonds schemes attempt to provide returns similar to Gold, the cost, risks and returns for investment in these schemes vary as compared to investment in physical Gold. The current status of these investments and comparative risks and returns are discussed.

**Gold Exchange Traded Fund**

Gold ETF – First Gold-backed ETF was introduced in Australia by ETF securities in March 2003 with an AUM of \$602 million. Since then, the Gold ETF has

been very successful in capturing the investor interest across many countries as a viable alternative to investments in physical Gold. Holding gold ETF instead of physical Gold helps investors to save taxes, both Goods and Services tax and wealth tax and concerns of purity and storage safety are eliminated. In India, Gold ETF is subject to long term capital gains tax. However, the returns on Gold ETF investment can be less compared to the price movements in Gold due to the costs like brokerage and commissions paid for the transaction, meeting the expenses of the fund managing the gold ETF. Additionally, when gold ETF is held in Demat account, the Demat account maintenance charges are also



an annual cost that affects the returns. Further, some of the Gold ETF is not as liquid as Gold.

Figure 4 presents the asset under management (AUM) of Gold ETF and the AUM of the mutual fund industry. The AUM of Gold ETF registered an impressive growth during the period 2007-2013, from ₹96 crore to ₹ 11,648 crores. During this period, the growth in equity markets was low, and the same is reflected in mutual fund AUM growth. With recoveries in equity returns, the interest in gold ETF declined with AUM falling. A steep recovery in Gold ETF AUM can be seen in 2020.

However, the growth of Gold ETF in India and Asian, in general, is far lower than those of other developed economies as can be seen in figure 5.

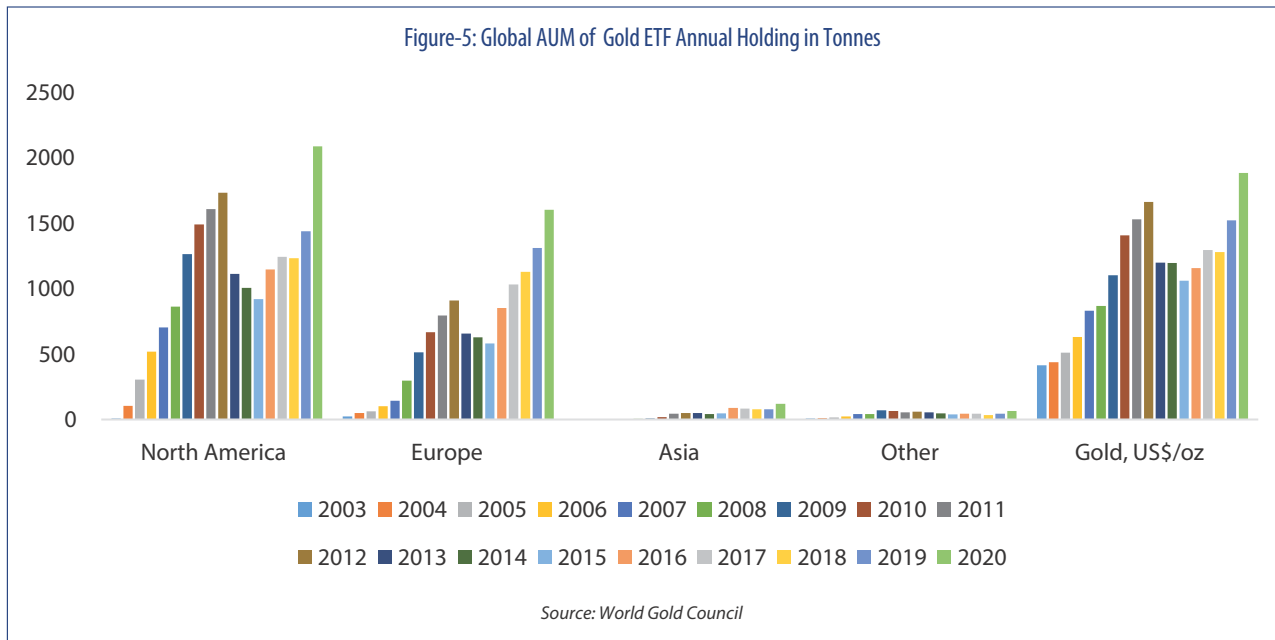
series of issues have been presented in Figure 6. The figure indicates that there was a sizable growth on the sovereign gold bond issue in the past two years. Sovereign gold bonds provide a regular return in addition to providing for appreciation in value based on gold prices.

**Commodity derivatives in Gold**

Commodity derivatives in Gold comprise of derivative products like futures and options that are priced based on the underlying product gold. They are used by the industry to hedge and others to speculate. Gold commodity derivatives were first added in the Indian markets in 2005.

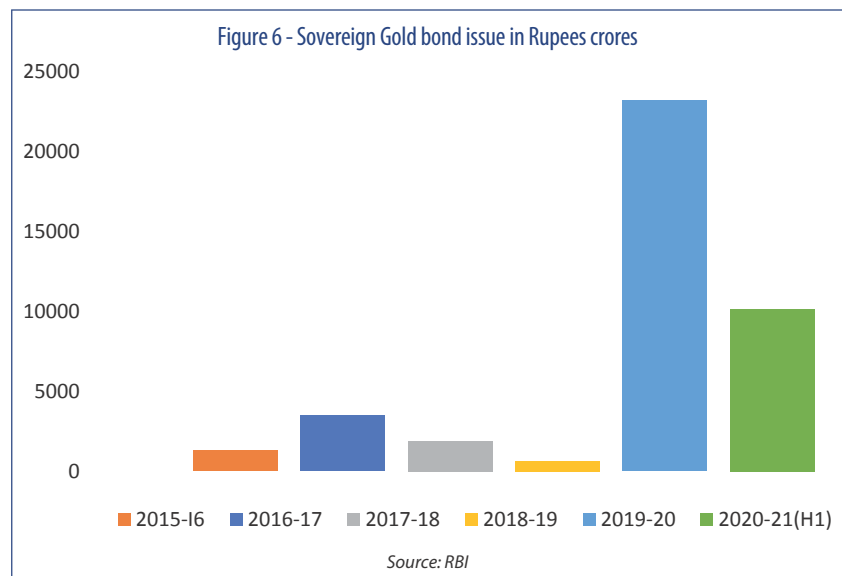
Indian commodity exchanges have the gold futures as a hedging instrument. The gold futures have been traded in

MCX in four categories based on the minimum lot size that is the Gold regular (lot size-1 kg), Gold mini Ahmedabad (lot size 100 gram), Gold Guinea Ahmedabad (lot size 8 grams) and Gold petal Mumbai (lot size 1 gram). The MCX has also introduced Gold options with underlying as Gold futures (options on futures) and Gold (called as options in goods/ commodity). Gold is one among the more liquid contracts traded on the exchange. Despite the above fact, the penetration of Indian commodity exchanges as compared to global exchanges is very low. Traditionally, banks and financial institutions were not allowed to participate in the exchange trading. With the recent change in regulations permitting institutions to participate, it is expected that trading volumes on the exchanges will increase in the future.



**Sovereign Gold bonds**

The sovereign Gold bond was introduced in 2015 by RBI on behalf of Government of India. These bonds are issued at values denominated in grams of Gold based on the value of 24-carat gold prevailing at the time of issue. The tenure of the bond is eight years, and the bonds are listed in the stock exchanges. The investor is provided with an option to exit the scheme on completion of 4 years of holding period. The bonds also offer interest at 2.5% per annum payable semi-annually. The minimum investment specified is 1 gram, and the maximum permissible investment is 4 kg per individual. The sovereign gold bond issue size per year with several



## Conclusions

Gold is regarded as a symbol of wealth, status and investment in India. Individuals and households consume gold jewellery and coins regularly, and the culture of buying Gold during festive occasions, gifting Gold during weddings is practised for many years. India is a significant consumer of Gold, and Gold was the second largest commodity in the import basket of India in the early part of the current decade. Thus, gold imports contributed significantly to the

current account deficits. Government of India brought about various restrictions in the import of Gold and alternatively introduced Sovereign gold bonds and promoted Gold ETF as an investment product that provided Gold like returns. Traditional saving avenues like bank fixed deposits, government bonds, post office savings schemes have failed to provide adequate returns to investors. Equities and Mutual fund investments have emerged as additional alternative investment options for individuals. Despite the emergence of various

alternate investment options, Gold continues to be favoured investment product due to reasons like the ability to return positive annual returns over long periods, liquidity consistently, acts as a good hedge and helps to diversify portfolio risk. The gold investment products like gold bonds and gold ETF vary from Gold in various aspects related to risk and returns. The relative positioning of the products is summarised in the table below:

Table 1 – Comparison of alternate gold investment products

Criteria	Physical Gold	Gold ETF	Sovereign Gold bond
Issuer	Jeweller or gold dealer	Mutual fund	RBI on behalf of Government of India
Denomination	Any quantity based on availability and need	The minimum investment amount is specified.	In grams of Gold. Minimum 1 gram and Maximum 4 Kg per individual
Tenure	Not specified	Depends on investor	Eight years with an option to exit after four years
Liquidity	Return to a jeweller. High	Can be traded in the exchange - Some ETFs are illiquid.	Listed in the exchange. Generally, illiquid with fewer trades.
Cost	Additional cost for storage and taxes capital gains and wealth tax. Jewellery - wastage and making charges	Subject to capital gains tax, Expenses by Mutual funds, transaction and Demat cost	Tax-free upon redemption. In addition, provides an interest return of 2.5% pa receivable semi-annually, which is taxable as income.
Returns	Match the price of Gold prevailing	May not track the prices exactly	Issue prices can be slightly different from prevailing gold prices.

Investment in sovereign gold bonds can be an attractive option over gold jewellery due to upfront excess cost paid towards making charges and wastages. Sovereign gold bonds also provide a return of 2.5% per annum on the investment, which is not

provided by Gold or gold ETF. Since, the redemption of the first series of bonds issued is yet to take place, depending on the redemption value and actual returns, the attractiveness of the same can be ascertained.

Gold as an asset class for investment – either as direct investment or as a reference for value accretion will continue to stay. So long as the Gold glitters as an asset class, derivative trading in Gold will flourish.

## BIBLIOGRAPHY

Association of Mutual Funds in India- <https://www.amfiindia.com/>

Bloomberg

Multi Commodity Exchange- <https://www.mcxindia.com/>

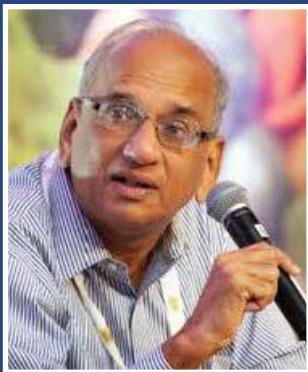
NITI Aayog (2018) “Transforming India’s Gold Market”, Accessed on October 19, 2020. Available at- [https://niti.gov.in/sites/default/files/2019-06/Report\\_GoldMarket.pdf](https://niti.gov.in/sites/default/files/2019-06/Report_GoldMarket.pdf)

Reserve Bank of India- <https://www.rbi.org.in/>

SEBI Hand Book of Statistics-<https://www.sebi.gov.in/sebiweb/home/HomeAction.do?doListing=yes&sid=4&ssid=80&smid=105>

World Gold Council (2017) “India’s Gold Market: Evolution and Innovation”, Report by World Gold Council, January 2017. <https://www.gold.org/>

# What would it take India to be a price-setter in global gold market?



**Mr. G. Chandrashekhar**

*Economist, Senior Editor and Policy Commentator*

*G. Chandrashekhara is a global agribusiness and commodities market specialist. He passionately analyzes and comments on agriculture, agribusiness and commodity markets (including energy and metals) as also international trade and developmental issues.*

*Apart from writing for India's most credible business daily (The Hindu Business Line) for over 25 years and appearing on business television and providing policy inputs for the government, he has been speaking regularly at national and international forums on a range of topics including Indian macro-economy, food and nutrition security, role of technology in agriculture, trade and investment opportunities, global and Indian commodities market outlook and so on. He holds several public positions including Independent Member, SEBI-CDAC and SEBI-RAC; Consultant, U.N. International Trade Center, Geneva; Independent Director on the Board of a few companies and visiting faculty in top B-Schools. Views are personal*

In the global commodity marketplace India is a notable player in respect of many commodities – either as producer or consumer or importer or exporter. For instance, India is the world's largest producer of milk and pulses, and the second largest in rice, wheat, sugar and cotton.

Of late the country has emerged as the world's second largest producer of crude steel and the third largest importer and consumer of crude oil, of course way below China in both. Also, we have had the distinction of being the world's largest importer and consumer of gold.

So, India holds a fairly significant position in the global commodity Balance Sheet, and is admittedly a dominant player in a few commodities. However, despite its notable position, India could seldom influence global commodity prices. India has been a price-taker rather than a price-setter for almost all commodities, except perhaps for niche and monopoly products like Basmati rice.

#### Backdrop

India's prominence in the global commodity market has continued to enhance especially after well-capitalized national exchanges trading online were established sometime in 2002-2003 to promote derivatives trading as part of price risk management. This followed gradual integration of the domestic market with the global market through the trade route and the investment route. Buoyed by the phenomenal success of the commodity derivatives trading in the first ten years of launch, some enterprising entrepreneurs started to talk about the need to convert India from the position of a price-taker to that of a price-setter.

Table 1: Value and Volume of Gold Import, Trade Deficit and Exchange rate

FY	Value	Volume	Deficit	Exchange rate
	\$ Billion	Tons	\$ Billion	Rs /\$
2015-16	31.8	968	-118	65.5
2016-17	27.5	778	-108	67.1
2017-18	33.7	955	-162	64.5
2018-19	32.9	982	-184	69.9

Source: Government of India

Gold was then the focus of attention and India's appetite for the yellow metal was ravenous. Imports increased year after year and so did the price of the metal. Double-digit growth in gold prices year-on-year for well over a decade till 2012 led people to imagine that India, as the world's largest importer and consumer, would be able to set global benchmark prices for gold.

#### Challenges

The talk of India becoming a global price-setter in gold was liberally touted, little realizing that the ecosystem was far from conducive. There was utter lack of policy support, investment support and research support, and not even a strategic roadmap to reach the destination. In retrospect it is reasonable to think that the talk was more of a gimmick to attract market participants than a genuine desire for India to play a pivotal role in the world market.

**Without doubt, the vision that India should become a price-setter in commodities where it enjoys a dominant position is a grand one.** While it is evocative and feels good to talk about India becoming a price setter, a look around the world would suggest it is not as simple as some people think it is.

Large production or consumption alone will not allow a country to become a

price-setter. Futures trading volumes alone cannot guarantee a country a place under the sun as a price-setter. There are many pre-conditions to be met; and sadly, no one discusses them. No wonder, even after a decade, we are nowhere close to setting global benchmark prices in any major commodity and certainly not in gold for that matter.

Some illustrations will help to know why. Despite being the world's largest producer of milk and pulses, the second largest producer of rice, wheat, cotton and sugar (to name a few major agri-commodities), India is hardly the setter of global benchmark prices for any of these commodities despite having a large production and consumption base.

To become a price-setter, in addition to being a dominant producer, we have to be part of the global value chain (GVC) which means allowing substantially free export and import trade. India is not in the GVC for many of the aforesaid commodities, barring perhaps cotton. We are advisedly not in the GVC, not because we do not want to be, but because it will bring its own challenges.

Given its socio-economic status, India can ill-afford to allow free export and import of commodities. We need to protect livelihoods of farmers in the

country as well as advance food and nutrition security. We need to keep our widening CAD (current account deficit) under check. In other words, our priorities are different. We face domestic socio-economic and political compulsions to insulate ourselves from global impacts in case of sensitive goods.

Countries that are prominent price setters are not only large producers or consumers, importers or exporters, but also are an integral part of global value chain with unrestricted foreign trade, easy currency remittance facility, transparent spot market and high level of quality assurance.

### Road Ahead

For India to become a genuine, respected price-setter for commodities, several pre-conditions have to be fulfilled, and many current challenges / weaknesses need to be addressed. These include:

- (1) Policy predictability;
- (2) Transparent physical market;
- (3) Robust quality assurance system;
- (4) Appropriate infrastructure (both solid and soft);
- (5) Integral part of global value chain;
- (6) Consistently high trading volumes on exchanges;
- (7) Currency convertibility; and
- (8) Strong regulatory oversight

### Does gold fit in?

For India and Indians, gold has mythological, historical, economic, social and cultural significance. There are references to gold in the ancient Indian scriptures and literature. Its economic significance as a store of value, the financial security it offers and its easy fungibility with cash are traits well recognized.

Gold is usually touted as a commodity in which India can become a price-setter; but it has not happened in the last several years despite large import volumes and consumption as well as rising derivatives trade volumes. It is critical to recognize that the status of being one of the world's two largest importers and consumers of gold by itself cannot give India the clout to set global benchmark prices.

#### (1) Policy predictability;

**The policy environment** for the yellow

metal is anything but supportive and predictable. In policymaking circles, gold is seen as a demerit commodity. Domestic economic compulsions including large and widening CAD as also revenue considerations often result in policy changes that adversely impact the market.

Customs duty on gold import introduced since January 2012 has been hiked from time to time. Duty is calculated on the basis of a tariff value which changes perhaps every fortnight depending on global price dynamics. Rules such as the 80:20 (mandatory export of gold jewelry to the extent of 20 percent of gold imported) more often than not distort the market and create a sense of uncertainty.

Policy predictability is critical. We need to create a stable, predictable long-term policy environment for gold taking into account the interests of all stakeholders. None exists today.

#### (2) Transparent physical market;

**The physical market** for gold is anything but transparent. Of course, the gold jewelry trade is getting increasingly organized. Over the last 10-15 years, many gold jewelry firms have come into the market with diverse geographical presence and large promotional budgets. This is a positive trend.

But the size of the unorganized market is still large. The street-corner traditional family-jeweler has sizeable clientele because of his long association with customers, perhaps over generations. Gold jewelry trade works on the basis of trust and relationship; and so, consumers still go to their trusted jeweler who is usually outside the purview of the formal market. **By the very nature of the relationship-based transaction, the purity of the metal is assumed to be what it is said to be. Often, transactions are in cash.**

Apart from the unorganized market of traditional jewelers, there is a grey market for gold. This market is dangerous and more distorting for the country's economy as a whole. The grey market usually deals in gold not imported through official channels (unauthorized imports, loosely called smuggling). The grey market brings with it complete lack of transparency in price and purity of goods as well as payment. Its backdoor entry into the market often results in price distortion. Extra-ordinary measures are necessary

to contain the grey market including stricter surveillance and exemplary punishment for offenders.

Indian borders are known to be porous. A huge differential between domestic and overseas prices caused by high rate of customs duty and steadily depreciating Rupee creates conditions for the grey market to thrive.

In case of official gold imports, it is necessary to establish an audit trail which among other things must ascertain the origin of the goods (usually in gold bars), source of payment, disposal of the imported material in the domestic market and conversion into jewelry, and eventual consumer purchase. In other words, gold market needs a system of end-to-end traceability which in turn will enhance transparency and good trading practices even while boosting the market confidence. However, 'there is no mechanism to measure the demand and sale of gold in domestic market', the Commerce Minister has admitted in Lok Sabha.

Unfortunately, unaccounted cash is often held in the form of gold given the metal's nature of high-value in low-volume. From time to time, reports of terror funds or drug funds moving into gold do the rounds. Traceability systems and audit trail are the way forward. It is indeed a tough call the policymakers will have to take if they are serious about ensuring market transparency.

#### (3) Robust quality assurance system;

**Quality assurance** ought to be a key element of the high-value gold market. Strict enforcement of consumer protection law is necessary. However, it is widely recognized that under-carating is the market's bane. Consumers would not know whether the gold jewelry they paid for is made of 22 carat or 18 carat or 14 carat gold; and for all that they may be paying for higher-caratage, but receiving material of lower-caratage.

As part of robust quality assurance system, Hallmarking should be popularized and made mandatory as soon as feasible. Adequate infrastructure (number of assaying and hallmarking centres, geographically well spread) is required before making it mandatory, as also clear guidelines to deal with in case of any breach of rules.

On January 15, 2020, the Government of India through a gazette notification notified the 'Quality Control Order for Mandatory Hallmarking of Gold Jewellery and Gold Artefacts Order,

2020' making hallmarking of gold jewelry and artifacts mandatory in the country with effect from January 15, 2021. Only three grades namely 14, 18 and 22 carats for gold jewellery and artefacts, as prescribed in Indian Standard IS: 1417: 2016 can be hallmarked. As on 25 December 2019, 892 Hallmarking and Assaying centres throughout India have been recognized by BIS. But the average utilization is less than 50 percent.

#### **(4) Appropriate infrastructure (both solid and soft);**

As important as physical infrastructure like assaying, transport and vaulting, is soft infrastructure which covers flow of information, technology infusion and skill development through training of artisans. Because the market is still largely unorganized, data capture and broadcast is more anecdotal. Lack of scientifically captured data often provides 'information arbitrage' and encourages speculative forces.

#### **(5) Integral part of global value chain;**

**Is India part of gold global value chain?** Unfortunately, No. Although India is a large importer of the yellow metal, it is not a part of GVC. Export and import both are not free, and there are restrictions. Import of gold and silver is restricted. The metals can be imported only by Nominated Agencies as notified by RBI (in case of banks) and Director General of Foreign Trade (in case of others). Import of gold and silver 'dore' is also restricted and can be imported only by refiners after obtaining a license.

While India exports and encourages export of value-added gold products such as jewelry, gold export as such – say gold bars - is not permitted. Even for jewelry there are value-addition norms to be followed.

A handful of entities covering a few commercial banks and State trading agencies are allowed to import gold. The user market has to depend on the import schedule of the importing agencies. The import policy has been made more restrictive in recent

times with the withdrawal of import permission to large export trading houses.

#### **(6) Consistently high trading volumes on exchanges;**

Without doubt, Indian derivatives exchanges need consistently high trading volumes. Gold is a unique combination of popular consumption asset and excellent investment asset that has given attractive returns over the last two decades. There is scope to further deepen and widen the domestic derivatives market. As market regulator, SEBI has been consistent in its approach towards deepening and widening the Indian commodity derivatives market. In order to promote Indian exchanges and to advance the idea of '**Trade in India**'; it is necessary that hedging by Indian entities takes place on Indian exchanges as much as possible.

Should Indian entities hedge their price risks in international exchanges or domestic exchanges? Normally, it is best left to the discretion of the Indian entity. However, it would be prudent that those Indian entities that seek to go to international exchanges to hedge their price risk should be mandated to hedge a decent part of their exposure in domestic exchanges. This will serve the twin purpose of promoting Trade in India as also advance the image and clout of the country globally. So, as part of the multi-step strategy to make India a price setter, entities with large exposure may be allowed to hedge 'a part' of their risk in international exchanges as well in addition to domestic exchanges

#### **(7) Currency convertibility**

In addition to the several pre-requisites mentioned above, a major roadblock to India becoming a global price-setter in gold is **currency convertibility**. Although perceived to be liberal as compared with the past, there still are restrictions on remittances from the country and compliance is onerous. The Rupee is not convertible on capital account as yet. On current reckoning, it appears that the Rupee is several years

away from becoming convertible on capital account.

#### **(8) Strong regulatory oversight**

**Regulatory oversight** is another issue. Gold faces multiple regulators. The regulatory oversight is scattered among several institutions including mainly the Ministry of Finance (fiscal matters), the Ministry of Commerce (foreign trade policy), the Ministry of Consumer Affairs (quality), RBI (financial institutions) and SEBI (derivatives trade). Often, a silo approach marks the regulatory oversight. This must change. Much greater coordination and clarity in policymaking, implementation of rules and promotion of gold is warranted.

**In conclusion**, for India to become a global price setter for gold, several preconditions have to be met which by themselves are 'necessary' conditions; but may not be 'sufficient' conditions. The issue of perception about the nation, ease of doing business, confidence of international financial institutions and investors in the long-term stability and sustainability of business as well as other factors will come into play.

There are those who point to cities like London and New York where large-scale gold trading takes place and suggest that India must take a cue by making a city like Mumbai (India's commercial capital) a gold hub. Lest we forget, London and New York have been financial centres for decades, having been home to and servicing large market participants such as institutional investors, commercial banks, large hedge funds, HNIs and others like globally recognized jewelry stores. There is a lot to learn from the evolution of these cities over decades.

India has a long way to go before being equipped to set global benchmark prices for any large commodity like gold. We have to start working on a strategic time-bound roadmap to address the several pre-requisites. We need to first set our house in order. It is an arduous challenge, but **the vision is worth pursuing**.

# Role of Bullion Banks in the development of Indian Gold Markets



**Harish Chopra**

*Senior Policy Consultant with  
India Gold Policy Centre @ IIM, Ahmedabad*



*Harish Chopra is currently a Senior Policy Consultant in India Gold Policy Centre at the Indian Institute of Management, Ahmedabad (IGPC@IIMA). Harish has a total work experience of 28 years that includes 21 years in banking and financial services in the bullion banking and retail banking space. Prior to his appointment at the IGPC@IIMA, he was working with a leading international bullion bank completing over 15 years in 2 tenures. Besides, he has handled senior roles heading finance functions at leading Indian Corporates. Harish is a 1992 batch Chartered Accountant and has also received Certification in Treasury & Forex Management from the Institute of Chartered Financial Analysts of India (in collaboration with the Institute of Certified Treasury Managers, US) in the year 2002. Harish is an avid follower of developments in the bullion markets and is presently working on more papers. His other areas of specialization include Business Strategy & Management, Accounting & Taxation and Risk Management. Harish follows a healthy lifestyle and has run Delhi Half Marathon for the past 3 years. In his spare time, he enjoys listening to music or getting behind a camera clicking wildlife.*

### **What is Bullion Banking**

Banking denominated by precious metals instead of currency is known as Bullion banking. Bullion banking is a specialized division of a commercial bank offering bullion products ranging from trading, lending, deposits, investment, hedging & risk management, vaulting & custodian services, depository & clearing services, and market research etc. Commercial banks generally carry out the bullion banking activities out of a division handling commodity, treasury & foreign exchange with the involvement of corporate finance. The client list of a bullion bank includes miners, refiners, central banks, jewellers, traders, industrial houses, and investors.

Bullion banking is a profitable business for commercial banks despite higher risks than conventional banking as a large portion of revenue is fee income which suits their financial goals.

### **Bullion Banks - Global experience**

Bullion bankers are one of the key participants in the bullion markets in developed countries. They provide a range of services across the bullion value chain right from mining till the end customer. They are the key liquidity and infrastructure providers and facilitate in bridging the gap between demand and supply cycle of precious metals.

London and New York have a long history of bullion banking. China and Singapore have emerged as other prominent centres over the past two decades. While London has historically been the largest OTC market, New York takes lead in future market through COMEX. Shanghai Gold Exchange in China is the largest spot exchange in the world. Bullion banks are the key participants in all these markets.

While the bullion banks are regulated by the Central Bank, they enjoy a fair degree of independence on their product offerings. The products are

structured based on the needs of local clients within the parameters of risk management policy of the bank. Central banks while regulating the bullion banks also provide liquidity by depositing their gold reserves and that lays the foundation of development of a local gold lease market. The bullion banking is however dominated by a handful of banks who provide full range of services. The sheer size of operations and the potential revenues drives the banks to hire specialized resources and invest in robust infrastructure.

To sum it all, bullion banks facilitate in creating trust, bring transparency and help in developing an organized market for bullion products.

### **Bullion Banking in India – Present scenario**

Despite being one of the most important consumer markets of gold, Indian gold market lacks trust, remains fragmented and largely unorganized. Bullion banks play a very limited role in the whole ecosystem and that is one of the reasons why the bullion markets are in the state where they are at present. In line of overall banking industry, bullion banking is also regulated by the Reserve Bank of India (RBI). RBI authorized scheduled commercial banks to import gold and provide bullion banking services way back in 1997. Since then, there has not been any significant change in the product offerings. Today, there are sixteen commercial banks in India who have been licenced by the RBI to import gold, only a handful of them are active though.

The limited success of bullion banking operations in India can be largely attributed to limited product offerings by the bullion banks in India. There are restrictions on the bullion banking activities of the banks which limits them to merely act as a canalizing agent to import bullion into India. Bullion banks in India import gold on consignment

basis from their counterparts overseas. The same is supplied to the customers on outright basis or under Gold Metal Loan Scheme (GML). The other bullion products offered by the banks include gold deposits under Gold Monetization Scheme (own account and on behalf of Government), distribution of Sovereign Gold Bonds (on behalf of Government), loan against gold, sale of gold coins on behalf of MMTC and custodian services for ETFs. The core activities of bullion banking are dependent on gold imports and overseas borrowing of gold.

The present regulatory framework is restrictive. Banks are not permitted to participate on the buy side on domestic physical market. Banks cannot participate in domestic commodity exchanges which restricts their ability to hedge locally or provide liquidity in exchanges. Not only is the product portfolio very limited, all the products are highly regulated. Banks do not have any freedom in structuring the products based on the market needs. For example:

- The gold metal loan can only be provided for a maximum of 180 days. Banks do not have any flexibility to structure this based on their own assessment of working capital cycle of their client. GML can only be repaid in rupees and not in physical gold as banks are prohibited to buy gold in domestic market.
- For gold deposits under GML, banks are governed by the master directions provided by RBI in their notification. The whole process of accepting deposits including the terms of deposits is regulated. It leads to mobilizing most of the deposits in Government account.

As a result of these restrictions, banks in India lack motivation. Bullion banking does not feature as a core business for most of the banks thereby resulting in

inadequate infrastructure, technology, and expertise to run the business.

### **Opportunities for Bullion Banks in India and the way forward**

Taking clues from evolution in bullion banking in a country like China, which like India, is a large domestic base of gold consumers, India has a long way to go.

The trend shows that global bullion market has been shifting more towards the consumer markets and as a result, we see exponential growth and development in Dubai, Singapore and China. India is one of the largest gold markets in the world with a huge number of jewellery manufacturing and retailing facilities, large refining base with an annual capacity of around 1600 tons, existence of commodity exchanges, banks providing bullion banking services for over two decades and a sizeable population, almost all of them a potential customer of gold in some form. A comprehensive policy on gold to enable banks to provide bullion banking services at par with global markets will be instrumental in transformation of bullion business in India and that provides a huge opportunity for the banks, some of which are discussed below:

**Buy gold locally and participate in domestic commodity exchanges** - At present, the bullion operations of the Indian banks are largely dependent upon imported gold. Allowing bullion banks to source gold locally and participate in commodity exchanges to hedge their physical market exposure can be instrumental in creating the required ecosystem to enhance the role and participation of bullion banking in India. Further, by participating in commodity exchanges and opening client accounts, bullion banks can create brokerage business.

**Gold Monetization** - Lower import of gold can be achieved by:

- diverting investment demand in gold towards domestic gold-backed financial products and paper gold.
- mobilization of household gold that directly reduces burden of import

Under both these initiatives, bullion banking can play a critical role in developing the desired ecosystem. An effective Gold monetization scheme can help in unlocking the value of gold.

**Development of investment products** - Banks in India can play a key role in development of gold-backed investment products like Gold saving accounts, Gold bonds and Gold accumulation plans. The incentive for consumers could be in the form of

a bouquet of products even for those who want to invest in gold not through the traditional way of buying jewellery.

**Enhancing the gold financing business** - Gold financing in India is concentrated to only major centres and is available only to jewellery manufacturers. The financing facilities are provided by Indian banks by borrowing out of consignment gold. In a country with annual gold demand of around 1,000 tons, largely in the form of jewellery, gold metal loans account for only 50 – 60 tons. Another opportunity for the Indian banks that remained untapped is financing the local refiners on their dore purchase and scrap financing. Financing to local refiners will not only meet the working capital needs of the local refiners but will also be instrumental in increasing compliance in the dore sourcing.

**Participation in Spot Exchange** - The development of International Bullion Exchange (IBE) in India would certainly provide lots of opportunities to the banks in India. It will lead to development of a state-of-the-art infrastructure for vaulting, logistics and trading. IBE will help the Indian gold market to bring in more efficiencies, better price discovery and assurance in the gold quality. Being the major liquidity providers, success of IBE would largely depend on the level of participation by bullion banks.

**Digital Gold** - Digital Gold is a convenient way of investing in physical gold without the hassle of holding it physically. It works as a gold accumulation plan which gives buyers an option to buy in small quantities and accumulate it over the period. Customers can sell or convert their holdings into physical Gold and take delivery at their convenience. Digital Gold has already got quite popular despite absence of bullion banks in this space. The product will get a better reach and get more popular once the banks are allowed to offer the same. Since the Gold is already within the vaulting arrangement approved by the Bank, the gold accumulated digitally can be easily placed as a gold deposit without the need of assaying or melting.

### **Suggested Framework for Bullion Banking in India**

It is often debated if it makes sense to create a new bullion bank altogether or an existing large commercial bank to play the role of a bullion bank, through its subsidiary, to carry out the bullion banking activities in India. The idea needs to be weighed on the following broad considerations:

- Creation of a new bank to undertake bullion activities will have its own set of issues like capitalization.

- We do not have any such precedence elsewhere. World over, the bullion banking activities are undertaken by the commercial banks through their specialized division.

- It will again be a restrictive practice and can go wrong absolutely with any wrong choices made.

One idea that can really work is to issue different licenses to undertake different bullion activities initially say for a period of 5 years. This restriction may be lifted thereafter once the bullion banking has matured and banks are more prepared to take this call based on their own assessment. For example, if a bank is strong in sourcing bullion, however, is not strong enough to manage domestic liabilities (GMS) or in lending operations (GML), they should be given license to only import bullion and distribute.

Bullion banking is a high-risk business needing a specialized skill set to manage it. As observed in the past, not all the banks are capable of handling such activities and therefore should be filtered away from the prime bullion activities of direct lending and borrowing initially. The license to manage full-fledged bullion activities should only be issued to select banks based on their willingness and assessment of their capabilities. That will reduce the number of banks to be in full-fledged bullion business significantly from the existing number of 16 banks. However, it will create an ecosystem where bullion banks emerge stronger and regulators grow more confidence in them to help them grow bullion banking in India.

- However, some of the banks, in view of their strong branch network should be allowed/ encouraged to act as Business Correspondents (BCs) to source GMS and GML clients on a fee basis.

- Providing working capital or term lending facilities to the gems & jewellery industry, which is not backed by physical gold, is not part of the bullion banking license and should continue as it is.

- RBI can monitor financial performance and compliances of bank's bullion activities by including it in their annual audit program.

### **Regulatory and Policy interventions required**

Except for the challenge of handling physical metal, where the banks struggle, the other operational aspects of bullion banking are quite similar to traditional commercial banking. While framing the guidelines, the policy

makers should look at the way the bullion business has been carried out in developed bullion markets in countries such as US, UK, Singapore and China and replicate the best practices in India. The regulatory framework for bullion banking in India needs a complete overhaul. Some of the suggestions which will go a long way to develop sound bullion banking in India are given below:

- Banks to be allowed to source gold locally and participate in domestic commodity exchanges. The Banking Regulation Act already allows it however a clarification note from RBI will be needed to implement this.
- There is a need to have a specialized department within RBI which exclusively regulates bullion related matters and provide guidance to banks. The new department also coordinates with multiple Government agencies looking after different aspects of bullion business.
- **GMS** - At present, banks do not find it attractive to run GSM due to the lack of infrastructure and the hassles of handling physical gold. The following tweaking can revive the GSM:

- The scope of GSM should be enhanced to include local purchase of gold.
- Banks should be allowed to sell minted coins out of monetized gold. It will provide an incentive structure within the GSM. It will help the banks to partly fund the monetization costs.
- A clarification is required on CDBT circular dated 1 December 2016. The limits of family gold holding should be clearly spelled out. No question on source of gold should be asked as long as the gold offered under GSM is within those limits.
- Jewellers to be included in the GSM process by including them as CPTC (already allowed but not well marketed) or the sourcing agents.
- Provide clarity on accepting digital gold under GSM without the need of melting it, if the same is within the loop, just as in the case of gold deposits by ETF.
- No gold deposits should be taken in Government account. The Government should even stop reimbursement

of mobilization cost and commission. Banks should be self-motivated to launch GSM and create a domestic book rather than relying solely on international leasing. This will help the banks to manage the risk better to fund their gold lending operations. The bullion banks should have complete freedom to offer innovative deposit products for a tenure, terms and process solely decided by them.

- **Gold metal loan (GML)** is a great tool to finance the working capital requirement of a jeweller. To enhance the GML business in India, banks should be given the flexibility to provide gold loans based on the working capital cycle assessed by them even if it goes beyond the present limit of 180 days.
- Banks should be permitted to accept physical bullion towards the repayment of GML. It will allow the jewellers to take advantage of discounts in the local market.

As an incentive for the banks in bullion activities, bullion in bank's account should be considered for the maintenance of cash reserve ratio.

## NOTE

The opinions expressed in this document are that of the writer and may not reflect the views of India Gold Policy Centre @ IIM, Ahmedabad

## REFERENCES

- <https://www.bullionstar.com/gold-university/bullion-banking-mechanics>
- <https://www.moneyland.ch/en/bullion-banking-definition>
- <https://www.gold.org/goldhub/research/need-bullion-banking-india>

# Gold: Time tested store of value and effective portfolio diversifier



**Mr. Chirag Mehta**  
*Senior Fund Manager -  
Alternative Investments*



**Ms. Ghazal Jain**  
*Associate Fund Manager -  
Alternative Investments*

Chirag Mehta Ranked as the 4th best Fund Manager in the world under the age of 40 by Citywire in 2017; Chirag Mehta has more than 15 years of experience in managing commodities. He also specializes in the field of alternative investment strategies. Chirag is a qualified CAIA (Chartered Alternative Investment Analyst), and has also completed his Masters in Management Studies in Finance. He currently manages five funds largely in the field of alternative investments that includes the Quantum Gold Fund, a Multi Asset Fund of Funds and an Equity Fund of Funds and the ESG fund. He joined the Quantum group in 2006 after gaining hands on experience in the physical commodities market during internship and continued association with Kotak & Co. Ltd and working on projects for the Federation of Indian Commodities Exchanges.

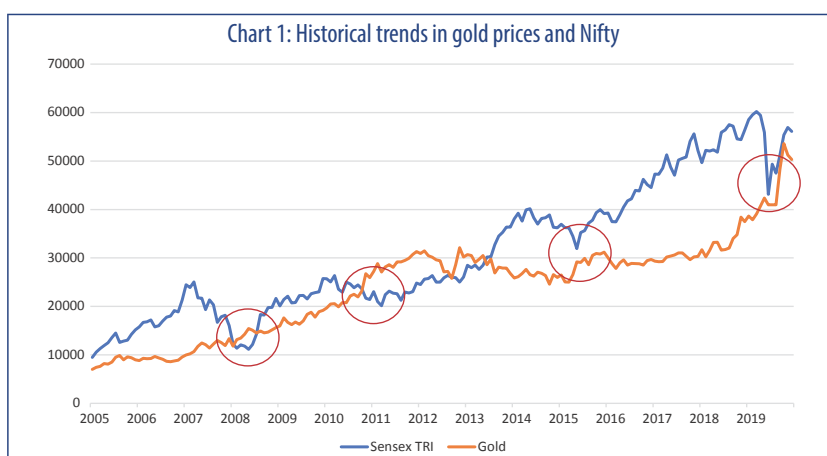
Ms. Ghazal Jain has 4 years of experience in the field of Finance and Alternative investments including Gold, Asset Allocation, Personal Finance, and Investment allocation. Ghazal has completed her MBA in Finance from the School of Business Management (SBM), NMIMS, Mumbai. She joined the Quantum Asset Management Company in January 2019. Prior to joining Quantum, she was associated with Fox Education LLP and Bahubali Electronics Pvt. Ltd.

It's 2020 and we are in the middle of a pandemic-induced global recession. After a deep stock market correction in March, equities are still highly volatile, making investors jittery. Investors holding some gold in their portfolios though seem to be a tad bit more relaxed. And naturally so. After all, gold is up around 25% this year, as of September end, not only limiting downside risk of the portfolio but also rewarding its holders with good returns. There is no doubt that gold is proving to be an effective portfolio diversifier through this unprecedented crisis.

Since we are talking crises and gold, **let's rewind and revisit** some of the previous ones to understand how gold has reacted during those events.

**Global Financial Crisis (2008)**

Let's start with the global financial crisis of 2007–2008. Excessive risk-taking by US banks in the post-9/11 lending boom combined with the bursting of the United States housing bubble hurt financial institutions globally and led to a global banking crisis. Corporate bankruptcies, government bailouts, stock market mayhem and a global credit freeze prompted investors globally to actively seek security of gold and US Treasuries. This crisis of confidence trickled down to emerging economies like India too and a reversal of portfolio capital flows led to a stock market crash of over 60% and decline in the value of the Rupee vis-a-vis US dollar, while gold gained by 31% (Table 1). The financial crisis was eventually transmitted to the real economy due to fall in exports and risk aversion of Indian



Source : Bloomberg Data as of September 2020  
Prices based on MCX Gold and Sensex TRI

Table 1: Performance of gold vs Sensex

Calendar Year	Gold INR	Sensex
2007	17%	67%
2008	31%	-61%
2009	19%	92%
2010	24%	24%
2011	31%	-36%
2012	11%	24%
2013	-19%	-2%
2014	0%	29%
2015	-6%	-8%
2016	11%	1%
2017	6%	38%
2018	8%	7%
2019	25%	16%
2020 YTD	36%	-8%

Source: NSE, MCX, Bloomberg Data as of July 2020  
Past Performance may or may not be sustained in future.

banks to extend credit in the face of a downturn.

**European Debt Crisis (2010-11)**

To deal with the recession following the Global financial crisis, the governments of various European countries increased their public expenditure by heavily borrowing. The threat of these countries, especially Greece, defaulting on payment of their debt and impacting global economic recovery put financial markets all over the world in turmoil. The overseas developments had a significant impact on Indian financial markets. As observed during the crisis of 2008, this crisis too led to a large withdrawal of foreign capital from the Indian stock market, eroding its value.

The financial chaos and resulting risk aversion, the monetary response in the form of Quantitative easing, and the European Debt Crisis 2010-11 led to gold prices jumping from little over \$700 per ounce in September 2008 to touch the level of \$1900 an ounce by October 2011. In INR terms, gold prices went up from approximately Rs 10,000/10 gms to above Rs 30,000/10 gms. During these years, the equity

markets around the world were volatile leading investors to heavily rely on gold to preserve their capital.

**Economic uncertainty and slowdown (2016)**

Then 2016 turned out to be a bumpy year for equities. The Sensex erased all the gains of the year and the yellow metal was charged up by the uncertainty emanating from the demonetization drive by the Modi government, Brexit, US elections. Gold gave an 11% return that year in INR terms.

Turns out one that doesn't have to look too far to notice the diversification benefit of gold. Because of its low correlation to equities, when the stock markets suffered, owning gold could have limited your overall losses. This evidence keeps mounting with each passing crisis leading investors to consider an allocation to gold.

**Gold as Portfolio Diversifier**

But to better understand gold's role in an investment portfolio, we decided to go further down in time and do a model portfolio analysis.

Turns out that a diversified portfolio of Equity, Debt and Gold in the ratio 40-40-20 would have generated a CAGR only slightly below that of a pure Equity portfolio over the years from November 2004 to June 2020. Inclusion of gold did add significant value as compared to the traditional equity debt portfolios. In addition, this could be achieved with lower risk which is evident from the much lower annualized standard deviation and maximum drawdown of the diversified portfolio. Win-win!

Clearly, gold is a portfolio must-have. But how much should one allocate to the asset class? We did some number crunching to find out.

The time period considered for the analysis, 1990-2019 (yearly data), encompasses multiple economic cycles and is long enough to generate a credible result. For simplicity purposes, we consider only two asset classes, Equities and Gold. We compare different portfolios that are yearly rebalanced: One with 100% equity and the others with varying proportions of gold allocation like 5% Gold and 95% Equities, 10% Gold and 90% Equities, 15% Gold and 85% Equities ... etc.

Table 2: Portfolio diversification with gold

Risk-Return	Equity + Debt + Gold *	Equity + Debt **	Equity	Debt	Gold
CAGR	10.36%	10.66%	11.59%	7.31%	12.36%
Annualized SD	9.55%	14.78%	22.41%	3.29%	17.29%
VAR	-15.75%	-24.39%	-36.98%	-5.43%	-28.53%
Maximum Drawdown	-21.43%	-38.74%	-56.17%	-6.27%	-25.22%
Sharpe Ratio	0.47	0.32	0.26	0.44	0.38

Time frame is November 2004 to June 2020. The period is taken from 2004 since the asset allocation weights are calculated based on normalizing the historical monthly equity and debt indicators. Given the normalization time frame used in the strategy, data availability for certain parameters beyond the time frame analyzed was a constraint. Compiled by Quantum AMC

\*Equity-Debt-Gold in ratio of 40-40-20. \*\*Equity-Debt dynamically allocated in 80-20 range

Based on Sensex TRI, Crisil Composite Bond fund index, and Domestic Gold Prices

**Note: Past performance may or may not be sustained in the future**

Table 3: Profitable allocation to gold

Portfolio	100% Equity, 0% Gold	95% Equity, 5% Gold	90% Equity, 10% Gold	85% Equity, 15% Gold	80% Equity, 20% Gold	75% Equity, 25% Gold	70% Equity, 30% Gold
Returns (CAGR)	13.54%	13.62%	13.65%	13.65%	13.61%	13.53%	13.43%
Risk (Standard Deviation)	32.31%	30.77%	29.24%	27.72%	26.23%	24.76%	23.32%
Maximum Drawdown	52.45%	48.29%	44.14%	39.99%	35.83%	31.68%	27.53%
Historical VaR (95%)	-22.91%	-20.83%	-18.81%	-16.90%	-15.23%	-13.86%	-12.56%
Historical Expected Shortfall (95%)	-38.54%	-35.08%	-31.62%	-28.67%	-26.04%	-23.42%	-20.79%
Annualized Sharpe Ratio (Rf=0%)	0.43	0.46	0.48	0.51	0.54	0.57	0.60

For equities we consider investment in Sensex (without dividends) and for Gold it would be Gold prices denominated in Indian Rupees (without any taxes, duties and levies);

Source: Bloomberg, Quantum AMC.

**Past performance may or may not be sustained in future**

As evident in the table above, an allocation to gold has helped reduce risk significantly. The important point is that such risk reduction has come without impacting overall returns from the portfolio.

The allocation would really depend on different factors like risk tolerance, other investments, cash flows / income, age profile, etc. However, generally speaking, the allocation should be somewhere between 10-15% of one's portfolio. This is because beyond this point, the returns on the overall portfolio start diminishing and also the incremental risk reduction also starts showing a diminishing trend.

**Having looked back in time, it is evident that gold is an excellent way to diversify a portfolio, an asset that thrives when uncertainty is rife, economies are struggling and markets are in turmoil.**

**Now, looking ahead, let's explore how various macroeconomic developments on the horizon, the seeds of which are sown already, are set to increase gold's portfolio relevance as a diversifier in the time to come.**

**Inflation is just around the corner**

Policy making globally is being dominated by the theory that economies can be made stronger via more monetary inflation, more credit expansion and more government spending. There is no doubt that the massive monetary policy easing and never seen before government relief packages have helped dodge a Covid-19 induced economic collapse. But the spike in monetary inflation as a result of the rapid money creation from central banks could result in more price inflation this time. Unlike the Global financial crisis where new money creation went to banks and financial institutions, this time it seems to be trickling fast to the real economy with handouts, paycheck protections etc . With a worsening pandemic and sluggish economic recovery, it is hard to imagine a scenario, where governments and central banks around the world will change this accommodative stance any time soon. The monetary inflation will result in weakening of the dollar and other currencies. Gold, known for preserving purchasing power over long time periods, will become a preferred choice for investors and savers seeking wealth preservation in such times. Gold acts as a counterweight to paper

money, which is fast diminishing its credibility as a store of value.

**Impending dollar weakness**

The dollar has been dropping dramatically. The currency has lost about 10% after scaling to highs of 103 levels in late March. This dollar weakness is being attributed to a host of factors - United States' inability to control the virus outbreaks and investor worries over its economic recovery being the major ones. At least, the US seems to be trailing dramatically as far as its management of Covid is concerned vis-à-vis its counterparts in Europe and therefore will have to do more to support the economy. Investors are thus, questioning the traditional view that U.S. economic growth and investment returns from the dollar would be higher than other countries going forward.

With this background, in a historic policy shift, the central bank of the United States will now adopt an "average inflation" target that will allow inflation to run above 2%, to make up for past shortfalls and support aggregate demand. An inflationary bias would translate into lower/negative real yields and sink the currency further, as more stimulus measures are announced, which will be supportive of non-interest-bearing gold.

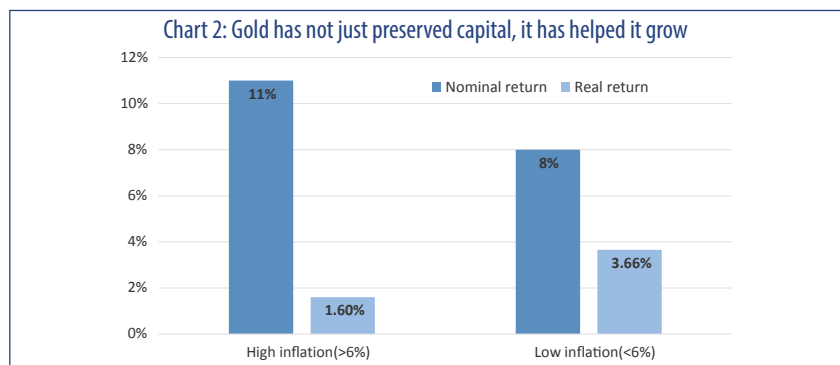
Amidst rising inflation expectations, Fed is determined to cap the rising bond yields leading to a large decline in real interest rates and the real 10-year yield moving well into negative territory. This puts significant downward pressure on the dollar and on the other hand an upward pressure on commodities and financial assets priced in dollars. The notion of not allowing the bond markets

to price in rising inflation expectations could only exacerbate the shift that's currently underway to hard assets and other instruments that offer inflation protection. It will then be difficult for the central banks to bring back the lost confidence and will require a move like Paul Volcker's use of super-high interest rates as a way of subduing inflation in the 1980s. This will eventually lead to a sharp decline in economy and risk assets. Gold would likely be a key beneficiary of the erroneous policymaking of negative real rates.

Record high debt levels by the United States government are threatening the dollar's reign as a reserve currency. Additionally, the EU's unprecedented move to issue common debt on behalf of all its members – something that was opposed in the past – is a move showing the bloc's solidarity and could increase the faith in the euro, weakening the position of the U.S. dollar as the only "global currency". This too should support gold.

Another factor that weighed on the greenback were heightened tensions between the United States and China which have intensified in the months after the pandemic broke out. Both superpowers are at odds on almost every front. As the relationship between the two further deteriorates, the risk of a military confrontation is growing. Such fears again hurt the dollar and were bullish for the yellow metal.

Gold being a relatively risk-free asset and the currency of last resort, will benefit from a protracted economic deceleration in the US, sharp increase in inflation, debasing of the dollar and low/negative real US interest rates. Gold, which is priced in dollars, moves

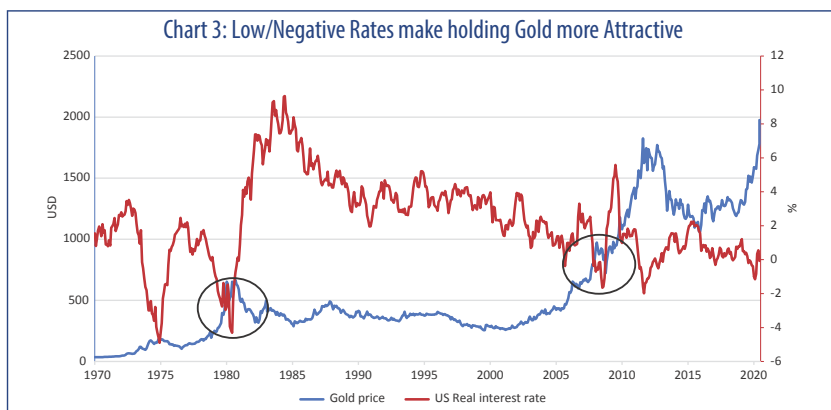


*Inflation is based on annual India CPI y-o-y changes from June 1980 to June 2020*

*Gold performance is based on MCX Spot 995 price from June 1980 to June 2020*

*Compiled by Quantum AMC*

**Past performance may or may not be sustained in future**



Source: Bloomberg; As on 31st July 2020

in an opposite direction to the dollar and will thus continue to benefit with a fall in the value of the dollar, as it is currently.

**Low yields limit bonds’ utility as diversifier against equities**

Central banks continued to remain accommodative for six years following the Global financial crisis of 2008 and this is many times more severe than that. This tells us that monetary and fiscal policies around the world will continue to be accommodative to boost GDP growth for the next few years.

Already, as per the IMF, global public debt is expected to exceed 100% of GDP in 2020–21, up from 80% last year. And the average fiscal deficit is expected to touch 14% of GDP in 2020, up from 4% last year. This is an unprecedented rise, and there is more coming. Low debt servicing costs are the only way to manage these debt levels that have grown too large to be managed.

Thus, bond yields and short-term interest rates are bound to stay low in nominal terms and negative in real terms for the foreseeable future. In addition, the potential for bond price appreciation isn’t much considering that rates are at all-time lows already. Both these things are expected to reduce bond returns and limit bond markets’ ability to act as a hedge against equity price volatility.

At the same time, this will minimise the opportunity cost of holding zero-yielding gold and increase gold’s portfolio utility as a diversifier. Especially, since we are now seeing the “don’t fight the central banks” liquidity-driven rally in equity markets that isn’t backed by real economic growth. Equity markets are on a sugar high from all the monetary and fiscal stimulus that has been pledged to cushion the economic

impact of the pandemic. But, this high will wear off sooner or later. The stage could thus be getting set for another market crash.

**Systemic risks sowing the seeds of the next crisis**

While accommodative monetary policy is crucial to bring the global economy back on its feet, a sustained period of extremely low interest rates will hurt banks’ profitability in the coming years. Businesses might find it hard to service debt in a plummeting aggregate demand environment. Thus, potential



Median debt-to-GDP ratio of country grouping based on G20 advanced and G20 emerging economies;

Sources: Financial Times, IMF historical debt database

credit losses resulting from insolvencies could also test bank resilience.

In addition, national debts of governments are mounting as they try to counter the economic damage of the Great Lockdown. For instance, The US national debt has reached 120.5% of the nation’s annual economic output. The debt has jumped a massive \$3 trillion

since the start of the pandemic to touch \$26 trillion. These debt loads not only impact an economy’s potential to grow but continue to weaken the purchasing power of fiat paper currencies. Such unprecedented expansion of balance sheets could potentially lead to defaults and debt crises in the long run, especially in the weaker economies. And evidently, gold would indeed be a big beneficiary when a crisis plagues the world’s reserve currency.

**US-China decoupling**

President Trump has threatened that the U.S. could pursue a “complete decoupling” from China. The two countries are the largest trading partners in the world. Bilateral trade between the economic giants had already decreased by 15% in 2019 on account of the trade wars. A further disengagement could damage global economic recovery at a time when international trade is already in the doldrums.

With Republicans and Democrats agreeing on this opposition to China based on Beijing’s handling of Covid-19, forced technology transfers, human rights abuses and its tightening grip on Hong Kong, the decoupling seems to have become a certainty regardless of

who wins the 2020 elections.

This will have consequences for global order and wide-reaching economic ramifications. The resulting uncertainty in equity, credit and currency markets will trigger a risk-off sentiment. This will push up investment demand for relatively safer alternatives like gold.



**Rising inequality and social tensions**

With jobs lost and economies suffering on one hand and asset prices soaring on the other, economic inequalities around the world will be exacerbated. Developed economies might come out stronger and emerging economies could go down further. This could potentially lead to geo-political and social tensions and push up demand for gold which has no country specific or political risks.

Long-term trends in gold prices are driven by changes in the overall level of confidence in the monetary system and the economy. Given the current economic backdrop, where governments are struggling with problems like rising deficits and unsustainable debts, it is indeed logical for gold prices to increase in value. With policy makers continuously debasing currencies, gold will be viewed as a preferred investment, lending some

solace to the chaos. In essence, an analysis of gold's historical performance as well as the current macroeconomic environment reinforce the relevance of holding gold in an investment portfolio. Gold is indeed a strategic asset that plays a risk-reducing, return-enhancing role over the long term.

# Domestic Gold Refining Industry: Challenges and the Way Forward



**Dr. Paramita Mukherjee**  
*Professor, Economics,  
International Management  
Institute, Kolkata*



**Dr. Vivekananda Mukherjee**  
*Professor, Department of  
Economics, Jadavpur University*

*Paramita Mukherjee* currently holds the position of Professor of Economics at International Management Institute Kolkata. An alumnus of Presidency College, Kolkata, Paramita has completed MS in Quantitative Economics from Indian Statistical Institute and Ph.D. from Jadavpur University. She has twenty two years of experience in industry, research and academics, with stints at AC Nielsen (formerly ORG MARG), ICRA and renowned business schools. She teaches courses on Economics, and Finance. She has been a visiting faculty in Presidency College, Kalyani University and Indian Institute of Management, Ranchi. She has conducted training programmes for executives under the auspices of CII, Kolkata. She has handled consulting assignments in the energy sector.

Her research interest lies in Financial Economics and Applied Econometrics. She has worked on contemporary issues in financial sector like foreign portfolio investments, mutual funds, stock market volatility, stock return co-movement and volatility spillover, share buyback, linkage among financial markets etc. Paramita has keen interest in applied studies on macroeconomic issues like inflation, private investment etc. She has authored a number of research papers in reputed international journals. She has handled responsibilities in academic administration as Dean (Academics) for five years. She was awarded research project from India Gold Policy Centre.

*Vivekananda Mukherjee* currently holds the position of Professor at Department of Economics, Jadavpur University, Kolkata. Before he joined Jadavpur University in 2002, he taught economics at the University of Burdwan and Ramakrishna Mission Residential College, Narendrapur. He received his PhD from Jadavpur University itself. He is also an alumnus of Jawaharlal Nehru University, New Delhi. He received research fellowships from Indian Statistical Institute, New Delhi, Swedish International Development Agency, FMSH, France and European Union; and visiting fellowships from INRA, France, Technical University, Dresden and Technical University, Freiberg in Germany and Monash University, Australia. He has attended many conferences and delivered a number of seminars in India and abroad. He has taught as visiting professor at Centre for Studies in Social Science, Kolkata, Indian Institute of Foreign Trade, Kolkata, Centre for Urban Economic Studies at Calcutta University, University of Gourbanga, Malda and Raiganj University. His research interest lies in Applied Microeconomics and Public Economics where he has published nearly fifty research papers in reputed international and national journals. He was also involved in number of research projects awarded by organizations like South Asian Network of Economics Institutions, South Asian Network for Environment and Development Economics, Government of West Bengal and India Gold Policy Research Centre.

The article is based on a project on Gold Refiners in India awarded and funded by India Gold Policy Centre (IGPC) @ Indian Institute of Management, Ahmedabad.

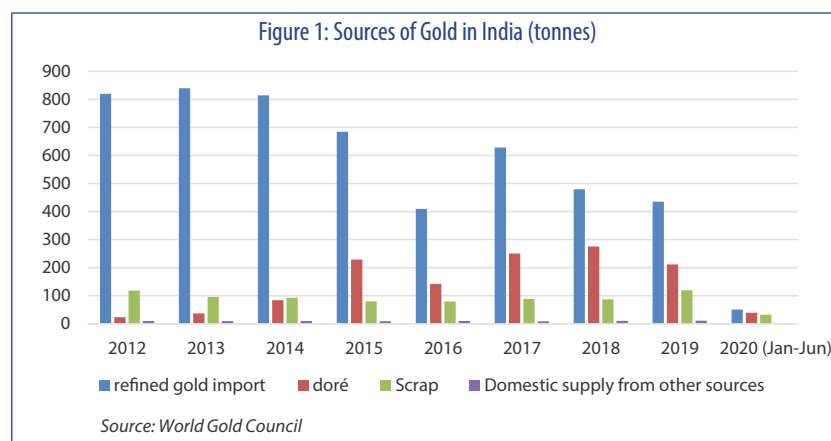
## 1. Introduction

During the COVID-19 pandemic, gold demand in India suffered a setback, with demand for April-June 2020 quarter at 63.7 tonnes compared to 213.2 tonnes in the same quarter a year back (World Gold Council). Gold refiners in India operate on imported gold dore bars and scrap gold collected from the domestic market<sup>2</sup>. During the pandemic-induced lockdown, the gold refiners faced a lot of difficulty as import of dore was interrupted severely and getting scrap gold also was a challenge. Consequently, some of the refiners had to stop operations temporarily (Economic Times, 2020).

Refiners are an important part of the gold supply chain. As per the report of Business Standard, 2015, around 32 gold refineries in India are there and 27 of them operate with a total refining capacity of 1,467 tonnes, with the average capacity utilization of only

20 per cent. The gold refinery industry has not flourished much, though Indian households possess around 25,000 tonnes of gold as stock and on average around 200 tonnes of dore is imported by India per annum (Business Standard, 2017). As of 2017, out of 292 tonnes of gold refined in India annually, while 200 tonnes are imported dore bar, only

92 tonnes are scrap gold. Since the scrap import is not allowed in India, it is evident that out of 25,000 tonnes of stock holding of gold, annually only 92 tonnes of scrap end up in refineries, which is a negligible amount. India also imports gold bullion (refined gold bar) from international refiners. According to the World Gold Council (WGC), during



2019, India's refined gold import was 435 tonnes that included gold imported for re-export (as jewelry, since bullion export is not allowed). Figure 1 shows the distribution of the different sources of gold supply in India in recent years.

There is a clear and distinct increase in import of gold dore over 2012-2018<sup>3</sup>. Over the same period the supply of scrap gold remained same and the domestic sourcing of gold remained negligible. However, the import of refined gold follows a declining trend over time, though the amount of bullion import has always been more than double of import of dore, barring only 2020. Since the price of dore import is less than that of bullion, growth of domestic refining industry is likely to lead to substitution of relatively expensive bullion import by cheaper dore import. This, in turn, would save the precious foreign exchange. According to NITI Aayog, 2018, an estimate of this saving is approximately US\$25 million for every 100 tonnes of raw materials. It would not only create value in the refinery industry, but also in the related industries like logistic, chemical, machinery etc. with the backward linkage in the supply chain. This would also help the jewelry industry to flourish as this is the consumer of the refined gold.

In a recently published research paper, Mukherjee and Mukherjee, 2020 reports the outcome of a survey of 14 gold refineries in India, conducted during the months of February to July, 2019. The information was collected by administering a detailed structured questionnaire through face-to-face interviews. All the sampled refiners operate in the organized segment of the industry. This article highlights certain trends in the refining industry, the challenges faced by them from the perspective of the refiners themselves and draws a few inferences or conclusions about the industry based on the survey.

**2. The Challenges**

The survey focused seven different aspects related to the operation of the organised gold refining industry, viz. distribution of firm size, inputs used and problems in their procurement, refiners' products and demand, quality of the product, capacity utilization, government subsidy in improving productivity and the treatment of sludge. It was observed that there is wide variation in the size distribution of the operating firms. The firms vary

widely in terms of their practices and views about different policy issues.

Most of the firms that operate as refiners are also either into bullion trading or into gold jewelry business. Thus, the entry in the refining industry seems to be part of the vertical integration strategy of the firms that are already in bullion trading or jewelry business. However, compared to the bullion trading/jewelry business, uncertainty in gold refining business is high, especially for small refiners, owing to purity concerns both at the input and the output end. The firms operate within a policy regulated margin of the difference between the tariff inclusive price of refined gold and dore. The refining capacity of the sampled refiners vary between 5-300 tonnes per annum, with most of them belonging to the small and medium segment having capacity below 50 tonnes. Only a few have a capacity of 100 tonnes or more.

**Business Practices related to Sourcing Input**

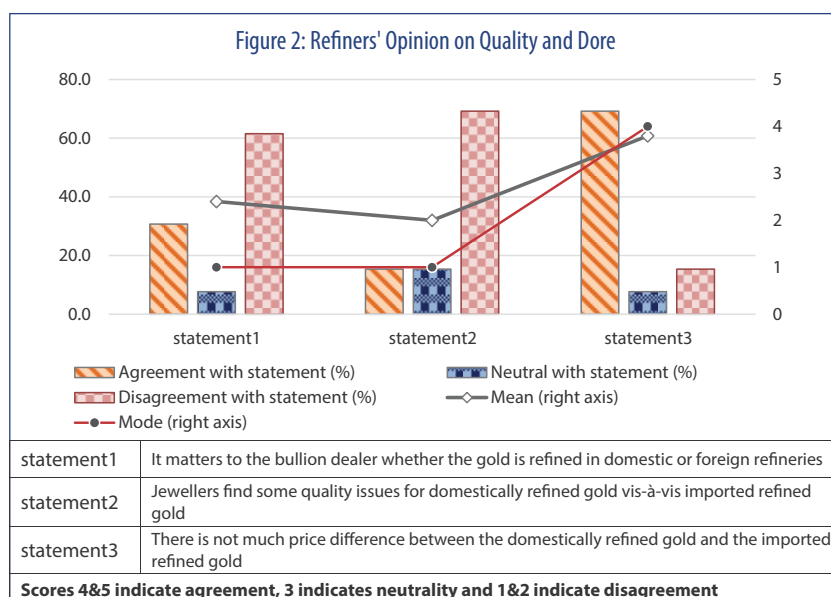
The firms differ in their business practices across region and firm size. The differences among firms by region stem from three factors: sourcing of the main input, difference in gold consumption pattern in different parts of the country and different process of sludge treatment. While in the southern part of India scraps are used as main input, in the north the main input is imported dore whereas in the western part the refiners use both scraps and imported dore as inputs. Gold jewelry for financing other purchases is more frequently utilised in south compared to the rest of India where gold jewelry is viewed as a last resort of overcoming

distress. While production discontinuity is more frequent in the northern part of the country, especially among the small refiners, because of weak demand and disruption in import of dore, no such problem is there in the south. In the west the problem of production discontinuity is less severe than in north. The southern and western refiners treat their sludge systematically either in in-house treatment process or sell it regularly to designated dealers, whereas in the north no such systematic pattern was reported.

The main difference in business practice according to their size of operation arises from import of dore. For responsible sourcing it is difficult for a small/medium refiner to identify an authentic miner abroad, as there are many small artisanal miners especially in countries like Ghana, Peru, Bolivia and Brazil from where the major import is done. So, many refiners have to depend on aggregators who act as middlemen for the contracts. Also, Indian banks do not provide loans for advance payments for dore imports and such import financing is facilitated by the aggregators. In most cases, the small/medium refiners do not have much bargaining power in deciding the terms of the contract.

**Quality of Gold**

The quality of the product is one of the most important aspect of the firms operating in the gold refining industry. Certification, plays a very important role. Among the surveyed refiners, all, barring one, either have or have applied for the government provided Bureau of Indian Standard (BIS) certification that guarantees quality of their product.



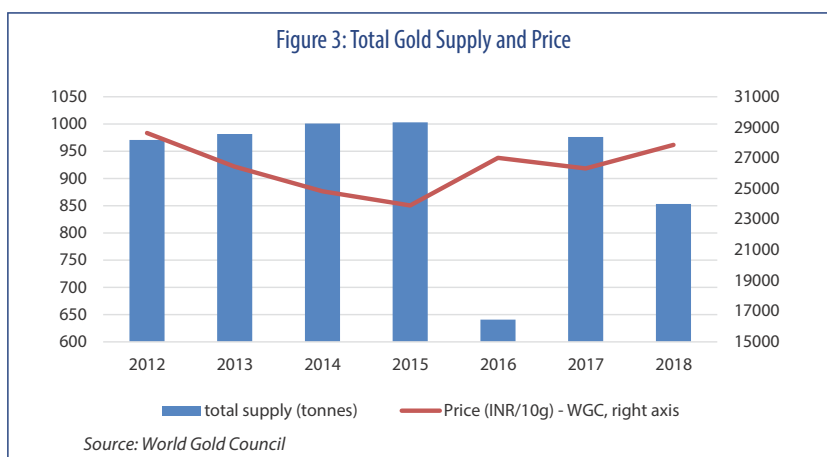
Source: Survey conducted by Authors

Only one firm in India possesses the London Bullion Market Association (LBMA) certification, an internationally accepted standard of quality. The other refiners are not contemplating to go for LBMA as they mentioned that the stringent criteria of LBMA certification is difficult to meet for the small and medium firms as it is expensive, and even if they could overcome the capital constraint, getting certified would have low return on their investment<sup>4</sup>. It is important to note that, most of the refiners (more than 60 per cent of them) claimed that their products are not discriminated against the imported or LBMA certified refined gold by the consumers though they admit that sometimes finishing and presentation of their product do not match the standards of the imported ones [Figure 2]. They mention two reasons for this. First, for gold if purity is ensured, the aesthetic look does not count. Second, some think, on the demand side there is a lack of awareness about quality of gold<sup>5</sup>. The refiners pointed out that although the drive towards BIS certification is a good step (around 46 per cent of the respondents think that BIS certification makes a difference about the perception of the quality of their product), infrequent testing may render it as ineffective. Around 77 per cent of the refiners would like Indian government to promote an 'Indian Gold Delivery Standard' (IGDS), a certification that would compete with LBMA certification both at the international/domestic market. They feel that National Accreditation Board for Testing and Calibration Laboratories (NABL) certification<sup>6</sup> of process of production is also important in this.

**Other Challenges**

Apart from the challenges of sourcing dore, the financing of import of dore and the standard of quality of the refined gold, refiners have also mentioned about some other challenges in this upcoming industry.

- First, owing to paucity of domestic supply of dore or scrap, most of the Indian refiners have to rely on import of gold dore, but they frequently face supply disruptions. The limited availability of dore in the world market is attributable to the practice of captive mining of many gold-rich countries of the world. Given the scenario, majority of the Indian refiners, being small and having volatile demand compared to the other players in the world dore market, cannot enter into a



B2B contract with the other miners for imports. In addition, there are administrative complexities related to responsible sourcing of dore, which makes it impossible for an individual refiner to resolve this issue.

- Second, since banks do not provide loan for dore imports, refiners' money in most of the cases are locked for months owing to imports and related formalities.
- Third, a section of refiners (nearly 60 per cent) believe that fragmented regulations in different parts of supply chain is responsible for hindering growth in refining sector. Existence of multiple regulations under several authorities for import of dore, quality of gold etc. creates lot of difficulties in running the business smoothly.
- Fourth, government support in terms of subsidies for training and technological development seems to be the need of the hour to boost the gold refining sector.

**3. The Way Forward**

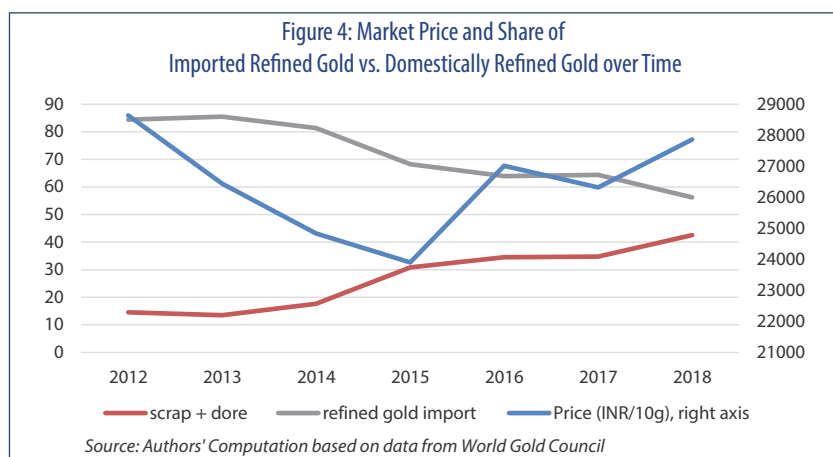
It is no denying the fact that the policymakers and other stakeholders understand the importance of a growing domestic gold refining industry. The industry is facing a number of challenges at the moment. However, a closer look provides some interesting insights about the scope of expansion of the industry which is described here.

Supply in Indian refined gold market comes from both import of refined gold and domestically refined gold that uses dore and scrap as inputs. The market price of refined gold is unregulated in India, has close connection with the international price of gold, and is determined by market forces of supply and demand. Since supply is demand

determined, we expect to observe a negative relationship between the market supply and the price<sup>7</sup>. Figure 3 that captures the movement of total supply of gold in Indian market over the period 2012-2018, too, confirms this intuition.

Moreover, if we look at the share of imported refined gold and domestically refined gold in the market for refined gold over this period in Figure 4, it is evident that in spite of a decline in the total supply with the rise in price, the share of domestically refined gold has significantly increased from 14.5 per cent in 2012 to 42.5 per cent in 2018, whereas the share of imported refined gold has significantly declined.

What would explain this phenomenal rise in the share of domestic refiners in the market for refined gold? First, though different types of firms, importers/domestic refiners of different types (large/small, having/ not-having certification, LBMA certified/non-LBMA certified, scrap based/dore based) are there in the industry, all of them receive almost similar price of their product at the market<sup>8</sup>. Since there is a duty difference of 0.65 per cent on imported refined gold and dore, the domestic refiners can leverage the difference to their advantage to charge a slightly lower price than the imported refined gold that helps them to capture higher market share at the cost of the refined gold importers in this high value market. Now, from Figure 4 it may be observed that the higher market price of gold accelerates the capturing of higher market share. Second, it is also possible that there is a quality difference between the products of the non-certified vis-à-vis certified refiners and it translates in a lower price that eats up the market share of refiners with certification. But one must also mention that the existence of uncertified products in the



market creates an adverse selection problem and acts as a hindrance for further growth of the share of domestic refiner that hurts every domestic refiner. Third, the total amount of dore and scrap over the years has never exceeded 400 tonnes in a year. Since there are at least three refiners at the market with installed capacity of more than 100 tonnes (one with 300 tonnes), it is not difficult to conclude that few refiners can very well refine the total import of dore in India and can capture the entire market. If we assume 1 ton of dore/scrap produces approximately 1 ton of bullion, the existence of so many refiners seems to be puzzling. Why the large firms are not able to drive out the small/medium firms from the industry? The existence of loyal consumers to the small/medium refiners and their

ability to offer price discount, often, in terms of lower quality seems to answer the puzzle. The standardization of the product through certification promises to expand the market that can naturally accommodate more firms in the market without being involved in price and quality competition<sup>9</sup>. It would make the market more competitive on the level playing field and make the survival of smaller firms easier once the problems related to supply of dore and scrap, and the issues related to tax structure are resolved.

Among other measures, following are some which are likely to facilitate the growth of the industry by removing the challenges faced by refiners.

- First, most of the small/medium refiners in India depending on

aggregators for sourcing dore often get exploited. Sourcing from captive mines can only be done at an institutional level. Also, since aggregators have a role to play in making payments to the mines abroad, at the institutional level (say banks), some mines abroad may be identified for entering with a long-term contract. Thus, government intervention is required.

- Second, if Gold Monetisation Scheme (GMS) is rolled out with proper incentives to banks, the input supply disruptions may be reduced.
- Third, export of refined gold bar, which is not allowed now by law, could expand the market for Indian refiners and reduce the volatility of demand as they would stop relying only on domestic demand.
- Fourth, India Gold Delivery Standard may act as a substitute for LBMA certification. It may be noted that bulk of the trust issue on quality of gold is expected to be resolved after imposition of mandatory hallmarking in January, 2021. Hallmarking may also boost the supply of gold scraps as well. However, proper certification on part of NABL and BIS needs to be ensured to create the brand of IGDS in terms of purity and global acceptability.

**NOTES**

<sup>1</sup>The article is based on a project on Gold Refiners in India awarded and funded by India Gold Policy Centre (IGPC) @ Indian Institute of Management, Ahmedabad.  
<sup>2</sup>Gold doré is semi-pure alloy generally composed of gold and silver, refined for further purification to be converted into refined gold bars. Scrap gold refers to any gold that is no longer of value in its original marketed form, e.g. broken/old jewelry or industrial by-products, which is sent to a refinery for recycling.  
<sup>3</sup>Dore import in India through open general license has been allowed in 2011-12. The increase in dore import may also be due to the fact that, during this period import tax on gold dore was lowered, to promote domestic gold refining.  
<sup>4</sup>The claim is that it fails to bring additional return in the market.  
<sup>5</sup>However, in a survey of Indian retail consumers, it was pointed out that there is some mistrust around product purity and trustworthiness of some retailers (World Gold Council, 2020). It seems there is a gap between what refiners opine about gold quality and what consumers perceive.  
<sup>6</sup>It is an organization that certifies quality in the production process.  
<sup>7</sup>This exactly reflects the inverse relationship between the demand for gold and the market price that is known to exist in India. This negative relation is confirmed by an estimation by Mukherjee et al (2017), where estimated price elasticity of gold imports into India is negative and range between -0.87 to -1.94.  
<sup>8</sup>This happens because most of the refiners are also in bullion trading/jewelry business and they use their reputation/goodwill to solve the quality issue which is crucial for selling their product in the market. Some of them may also have some loyal consumers.  
<sup>9</sup>The monopolization of the market by the dominant firm does not seem to be a possibility in this market because of the threat of cheaper import of bullion from international market.

**REFERENCES**

Business Standard (2015), 'Uttarakhand emerges a gold refining hub' by Rajesh Bhayani, November 23, 2015.  
 Business Standard (2017), 'India to have gold sourcing standards for refiners' by Rajesh Bhayani, December 5, 2017.  
 Economic Times (2020), Covid-19 Impact: Half of the gold refineries in the country closes down, S. Ghosal, June 15, 2020.  
 Mukherjee, P., V. Mukherjee and D. Das (2017), Estimating elasticity of import demand for gold in India, Resources Policy 51, 183-193.  
 Mukherjee, P. and V. Mukherjee (2020): 'Assessing the Scope of Gold Refineries in India: Evidence from Survey Data', Resources Policy, 69, 2020. <https://doi.org/10.1016/j.resourpol.2020.101810>.  
 NITI Aayog (2018), Transforming India's Gold Market: Report of the committee, NITI Aayog: New Delhi.  
 World Gold Council, (2020) Retail Gold Insights: India Investment

# Harnessing Gold Resources for Development in India: The Sustainability Dimension



**Dr. Prabhakar Sangurmath**

*Former Geologist, MECL and Executive Director, HGML*

*Dr. Prabhakar Sangurmatah is a former Geologist, MECL and Executive Director, HGML. He has 35 years of experience in identifying viable gold (Primary & Secondary) and base metals mineral properties for exploration, mining (Underground & Open-pit), Processing i.e. Planning, Execution, Documentation, Feasibility, related R&D activities and Project Management. Travelled national and international extensively for Exploration and Mining. 24 years unique experience in world class deep Underground Gold Mine. He has served as Member, Convener and Chairman of several committees on exploration, mining, environment, management and related R&D. Prepared several technical reports, published papers in international and national journals. Attended seminars and conferences at national and international levels and chaired the technical sessions. He has guided and advised PhD, M. Phil, MSc theses.*

*In recognition of his significant work in exploration, mining and research he has received many awards, honours, laurels conferred including “National Geoscience Award” from Govt of India, as well as membership and fellowships of important professional, academic bodies and Council Member of Geological Society of India. After serving as “Geologist” in Mineral Exploration Corporation Ltd (A Govt of India Enterprise) and in Hutti Gold Mines Co.Ltd(HGML) for 35 years in various capacities, superannuated on retirement as “Executive Director” from HGML. Currently Adjunct Faculty in National Institute of Advanced Studies, Indian Institute of Science Campus, Bangalore and Member of the Council of the Geological Society of India, Bangalore.*

Presently, primary gold production comes essentially from Karnataka i.e. Hutti Gold Mines Co. Ltd., (A Govt. of Karnataka Enterprise). Which produces nearly 1.8 tonnes of gold per annum, which hardly constitutes not more than 0.1 – 0.2 % of the total world's gold production. Apart from these primary sources of gold, gold in small quantities is also produced as a by-product during the refining of copper by HCL (A Govt. of India Enterprise). The Bharat Gold Mines Ltd., from Kolar Gold Fields of Karnataka has a continuous glorious gold production almost 120 years, has produced about 800 tonnes of gold and ranked as giant gold field of world class. Considering the deep mining (> 3 Km deep), geo-thermal gradient, economics, administrative problems have forced, M/s. BGML to close its operations from March 2001. At present the Hutti Gold Mines Co Ltd (HGML), from Karnataka is a leading gold producer in India. The Hutti Gold Mine is the oldest metal mine of the world.

The Archean terrain of Karnataka has ancient / modern workings in every district of the state. The potential of some these workings were explored by Geological Survey of India (GSI), Mineral Exploration Corporation Ltd., (MECL), Bharat Gold Mines Ltd., (BGML), Hutti Gold Mines Company Ltd., (HGML), State Dept of Mines and Geology(DMG) and other private agencies.

Available literature of already carried out exploration in various prospects of Karnataka and the voluminous geo-data of operating world – class

Hutti Gold Mines suggest that considerable mineral potential still exists in Karnataka. As such, there are good chances of discovering few more promising deposits, may be at depth. The employment of exploration techniques viz detailed geological mapping, geochemical & geophysical survey, trenching, diamond drilling, exploratory mining etc. vary for each prospect, as it solely depends on the nature, present knowledge and amount of information already available and on particular prospect.

The gold resources (about 585 tonnes of gold metal) established by Govt and Private agencies should be upgraded by substantial drilling, exploratory mining & feasibility studies to reach a mineable reserves.

Hence, the big process of prospecting, exploration, developing and establishing new gold mines in the country should receive serious consideration at all levels of decision making.

#### **GEOLOGY**

The Indian gold occurrences can be broadly divided into two classes namely: Primary and Secondary.

Primary gold deposits are found mainly in granulite terrain of Archaean age(2600 to 3200 M.Y) in Tamilnadu and Kerala (Wayanad - Nilambur); the Dharwar greenstone belt of Archaean to early Proterozoic age (2100 to 3000 M.Y) confined mainly to Karnataka and Andhra Pradesh (Kolar, Hutti, Nuggihalli,

Mangalore, Gadag and Shivamoga belts); Bijawars of middle Dharwar age in Madhya Pradesh (Sonakhan, Bhagmara and Deogaon blocks); the Sakoli group of early Proterozoic (2200 M.Y) in eastern Maharashtra (Bhwapur - Kolari); the Dhajori group of middle proterozoic (1700- 2000 M.Y) in Bihar and Orissa (Lawa), Kunderkocha, Sonapet, Sona of Bihar and Telkoli, Banspal blocks of Orissa); and Deccan trap(30-90 M.Y) in Gujarat(Alech hills).

Secondary gold deposits are seen in Wayanad - Nilambur gold fields of Kerala; in Keonjhar district of Orissa; Raigharh district of MP; Chikmagalur of South Kanara, Shivamoga districts of Karnataka; Siwaliks of Jammu, Haryana, HP, UP, Tippam sandstone of Assam.

#### **MODE OF OCCURRENCE**

Gold occurs in a variety of geological settings. The following are the principle modes of occurrence observed in India (Radhakrishna & Curtis: 1999).

##### **1. Lode gold:**

Quartz-carbonate vein type: Usually confined to metamorphosed volcano-sedimentary rocks forming linear schist belts of late Archaean age (greenstones) and invariably in the form of Au-quartz veins occupying fissures and shear zones persisting to great depths. This type of deposits have been and remains the main source of gold. They are second and only to the paleo placers of the Witwatersrand type.



**2. Gold in Banded Iron Formation:**

This is generally seen in association with schistose amphibolites and banded iron formation of late Archaean age, Chitradurga and Sandur belts (Eg: Chinmulgund, Ajjanahalli and Sandur in Karnataka, Sonadehi in Madhya Pradesh).

**3. Gold in Granulite terrain:**

This type is similar to the vein and stratiform type described under (1) & (2) but falling within the granulite terrain of south India. (Eg: Wayanad, Kerala) which is in continuous gradational transition from greenstone terrain.

**4. Disseminated gold:**

Gold commonly occurs in disseminated form throughout an intrusive body or volcanic rock. The grade of ore is poor but deposits are amenable to large scale mining operation by open cast methods. (Eg: Malanjkhanda in Madhya Pradesh).

**5. Gold associated with early Proterozoic volcanogenic polymetallic sulphide deposits:**

In this category are included deposits of copper, lead and zinc containing values of gold, silver and other metals. (Eg: Khetri in Rajasthan, Rakha in Bihar). Gold production from these deposits containing less than 1 ppm, in recent years has become significant, gold as by product.

**6. Gold in quartz pebble conglomerates and quartzites (ancient placers):**

Detrital gold commonly occurring in quartz pebble conglomerate resting uncomfortably on older gneisses, schists at the Archaean Proterozoic boundary (Eg: Bababudan in Karnataka, Dhanjori in Bihar, Cuddapah in Andhra Pradesh).

**7. Greywacke or turbidite hosted deposits:**

These occur in late Archaean sedimentary successions along with volcanic intercalations. (Eg: Gadag in Karnataka).

**8. Gold in coal:**

Report of gold in coal of New South Wales opens up a new area for exploration. (Lamproite dyke rocks intruding Gondwana).

**9. Epithermal 'bonanza' type deposits of Tertiary age (Mainly in North America Cordillera region):**

The younger granites of fold mountain chains and altered volcanic rocks are likely to show concentration of gold. These have yet to be identified in the Central Himalayan region and their economic potential to be ascertained.

**10. Placer and alluvial gold:**

Alluvium of rivers draining auriferous tracts and showing concentrations of detrital gold. (All river gravels).

**11. Gold in laterite, soil and weathering profiles:** This is a newly recognized mode of occurrence of economically exploitable gold. (Example: Nilambur valley, Kerala).**Gold Exploration in India:**

Gold occurs in a variety of geological settings. India holds about 20,000 tonnes of gold which is stated to be the largest stock of gold in the world.

Exploration is high risk:

- \* 1000 mineral prospects found.
- \* 100 are reconnaissance drill tested.
- \* 10 are intensively drill tested.
- \* 1 becomes a mine.

**STAGES OF GOLD EXPLORATION**

In common practice there are three stages of gold exploration, viz. 1) the reconnaissance or prospecting, 2) preliminary exploration and 3) detailed exploration with distinct objectives. Fundamental aim of exploration being establishing the quantity and quality (reserves and grade) of deposit, each successive stage of exploration leads to identification and estimation of resource/ reserves with varying degrees of confidence. At each stage, the target area reduces but the intensity of exploration increases. In India, the first two are generally carried out by organization like Geological Survey of India, State Geological Department, private agencies etc. The detailed exploration has been the responsibility of agencies like Mineral Exploration Corporation Limited (MECL), Private Agencies and exploitation agencies etc. By the time this stage is reached, a broad idea of the geological controls, size, shape, possible reserves and grade of the deposit is available to facilitate the selection of blocks or prospects for

detailed exploration.

**PURPOSE OF GOLD EXPLORATION**

The main purpose of the exploration programme is to convert the "Resources" into "Reserves" and upgrade the, "Possible reserves" to "Proved" and "Probable" categories and to estimate their grade and tonnage for feasibility studies as per UNFC, leading to investment decision on exploitation of the deposit. In the context of the feasibility studies, following information is to be collected (Sangurmath: 1996, 2003).

- a. Establishing lateral continuities and correlation of the auriferous zones identified during the course of preliminary investigations.
- b. Assessing the grade, width and variability of the lode by close-spaced sampling.
- c. Statistical and Geostatistical evaluation of the exploration data and 3-D ore body modelling.
- d. Establishing the size, shape, geometry of the ore bodies to assess their overall potentiality.
- e. Petrological, mineralogical, fluid inclusion, isotope and age characteristics of ore and host rock.
- f. Geotechnical characteristics of ore and the host rocks to help in mine designing.
- g. Environment (Core & Buffer Zone), GIS studies, Remote sensing and Geo-hydrological during exploratory drilling and in the mine development.
- h. Ore beneficiation studies.
- i. Conduct definition drilling from underground to delineate lode zone in depth and to study the structure, which may result in unstable mining condition/ ground condition.
- j. To convert the drill indicated / probable reserves to the mine proved ore reserves (UNFC classification).

**STRATEGY OF GOLD EXPLORATION**

The high price of gold has made even very low metal to rock ratios workable. The average grade produced in India has fallen from 47.5 g/t in 1891-1900 to 3 g/t in 2020. It is thus imperative that, a high degree of accuracy is to be attained in the evaluation of the lean ore bodies. In view of the high degree of variation in width (pinch & swell structure) of

lodes and heterogeneity of distribution of gold in the host rock, borehole data by itself is not a reliable tool of mining. Therefore, a judicious integrated programme of exploratory drilling and

exploratory mine development with close spaced sampling is considered to be the reliable method of assessment of gold lodes.

The MECL has played a pivotal role in

the detailed exploration of gold (Shekar et. al 1996). The reserves and grade established (Shekar et al. Al 1996) in some of the major greenstone belts are as follows:

Table 1: Reserves and Grade of Mallappakonda - Chigargunta Prospect (Southern part of Kolar Greenstone Belt)

Block	Lode Designation	Strike length(M)	Depth (M)	True width (M)	Av. grade(g/t)	Reserve (Million tonnes)
Mallappakonda Block	--	110	<b>170</b>	--	2.47	0.773
Chigargunta Block I (West)	Mafic lode	195	385	1.24	7.79	0.623
Chigargunta Block-III(West) (Centenary Block)	Contact lode	700	287	1.78	5.02	0.397
Chigargunta Block III and lode IV(East)	Felsic(E-2)	325	169	1.94	5.28	0.322
Chigargunta Block-V(East)	Felsic lode(E-2)	400	322	2.59	3.97	1.057
Chigargunta Boundary Block	Felsic lode(E-2)	520	348	2.20	4.34	0.517

Table 2: Reserves and Grade - Ramagiri Gold Prospects (Ramagiri Greenstone Belt)

Block	lodes	Strike length(m)	Depth(m)	Reserves (Million tonnes)	Grade(g/t)
Chennabhavi Mine	2	45-63	<b>50</b>	<b>0.138</b>	1.45
Ramagiri South shaft area	3	30-46	150	0.082	4.85
Yerrappa Sector	-	275	60	0.257	1.91
Gantalappa	1	200	60	0.106	2.38
Gantallappa	1	65	95	0.019	5.64

Table 3: Reserves of Gold Ore in Gadag Schist Belt

Block	Strike length	Depth(m)	Reserves (Million tonnes)	Grade (g/t)	Av width(cm)
Hosur Champion East	650	375	<b>0.438</b>	<b>2.84</b>	138
Hosur Champion West	1,000	395	1.192	2.46	150
Hosur sector	900	280	0.56	2.07	139
Mysore mine	492	50 (500'L)	0.062	3.70	141
Sangli mine (Norhtern sector)	500	-	0.556	2.61	207

About 70 tonnes of gold metal is categorized as reserves (economically mineable) and resources of gold is about 585 tonnes of gold metal identified by GSI, MECL, HGML and other agencies. These reserves and resources exist in deposits and prospects spread over 11

different States of the country. However, these resources await upgradation by substantial deep diamond and RC drilling, resource modeling, exploratory mining and mining feasibility studies before they reach the status of mineable reserves.

**MODERNIZATION OF TECHNOLOGY IN GOLD EXPLORATION**

The existing status of regional / preliminary /detailed gold exploration is mainly restricted to search for ore deposits in and around ancient / modern mine workings. So far, traditional exploration has been done following surface outcrops and old workings. Since most of these direct targets have been investigated.

We have to look for deposits in virgin area, hidden wholly below the ground (concealed) by application of sophisticated methodology/equipment and technology such as:

- 1) Conceptual exploration by geological modeling.

Table 4: Gold Reserve Position

		India
Gold Ore (Million tonnes)	Primary	503.84
	Secondary	26.12
Metal (tonnes)	Primary	654.74
	Secondary	5.86

Source: Indian Mineral Yearbook 2018, IBM

- 2) Use of Remote sensing techniques with satellite imageries and air photos.
- 3) Ground and air-borne Geophysics.
- 4) Use of on-site portable analyzers, Geochemistry, Vapour geochemistry
- 5) In case of detailed -developmental exploration, which account for major share of exploration inputs and optimize the quantum of exploration without sacrificing the detailed exploration reliability and accuracies of geometry of ore, reserves and grades.
- 6) Review of case histories used in country and other parts of the world with correlation of complexity of ore body with investment needs etc.
- 7) Meticulous geological and structural mapping.
- 8) Induction of checks and counter checks in sampling, sample preparation and analysis.
- 9) Use of cheaper and more reliable sampling and sample preparation techniques.
- 10) Data management by use of computer systems use of computer for storage, retrieval and evaluation of exploration data.
- 11) Modernization of cartographic methods.
- 12) Geostatistical methods for optimization of exploration programme and reserve estimation.
- 13) Petrology and Mineralogical studies.
- 14) Ore beneficiation and metallurgical studies to absorb modern technology to search for and appraisal of ore bodies of marginal grades mineral deposits.
- 15) R & D in exploration.
- 16) To promote preservation of ecological balance and prevention of environmental pollution (EIA & EMP).
- 17) Investigation on mineral physics.
- 18) Isotope, fluid inclusion, microprobe and geochronology studies.
- 19) Development of integrated multidisciplinary approach in the exploration.
- 20) Correlation of aero magnetic data with ground geology for evolving concepts for mineral search.
- 21) Recovery of metal from mine waste and tailings. Utilization of tailings in mine void fillings, road metal, fertilizers, ceramics etc to be studied.
- 22) Geo-botanical etc, studies.
- 23) Rock mechanic and geo-technical studies.
- 24) Core library.
- 25) Another short coming in the present system is that the data locked up in the unpublished reports of various survey organizations are not readily available to other organizations and user agencies. The necessity of building up a well-organized Geo-data center is necessary.
- 26) Small scale mining and satellite gold mines development should be carried out to the existing gold mining complex, which will attain the production stage with minimum gestation period from exploration to mining as there are several small, marginal grade and narrow width gold deposits, which cannot be worked independently. This type of development will uplift the socio-economic condition, infrastructure development, skill development and employment opportunities to the rural backward areas.
- 27) Geo-tourism Hub and Geo Industrial park to surround the newly developed revived KGF mine being proposed by the state with the ex-workforce: KGF area is known for its ecological and for social-cultural diversity. The proposal of developing KGF as an educational Geo-tourism center forming an integral part of the larger Geo-park theme needs serious considerations. A museum showcasing aspects of ancient to modern mining methods and objects would be a desirable attraction to tourists, visual appeal, educative value, scientific importance, social, cultural significance, tourist and students. There are verdant green forests and semi-tribal settlements, modern horticultural ventures and admirable temples, architecture in and around KGF, Hutti, Gadag, Ramgiri Gold Mines etc. The tourist attraction added can be great.

#### **OPPORTUNITIES TO INCREASE GOLD PRODUCTION**

Gold, the oldest metal known to man, still dominates the world scene. India

was renowned for its gold from time immemorial, but presently it is only a minor producer of gold. The gold exploration inputs have been increased significantly after independence. Gold deposits are formed by a very wide variety of geological processes. Gold deposits are classified as primary, alluvial or placer, or residual or laterite deposits. Orogenic gold or lode - type gold represents one of the primary mode of gold mineralization, which contains high - grade ore in thin quartz veins, Lode gold deposits are usually hosted in basalt or in sediments known as turbidite and are intimately associated with orogenic belts and other zones of plate interaction. Most lode gold formed by dehydration of basalt during metamorphism. The gold is transported up faults by hydrothermal fluid and deposited, when the fluid cool too much to retain gold in solution. Intrusive related gold is generally hosted in granites, porphyry or rarely in dikes.

The existing status of regional/preliminary/detailed gold exploration is mainly restricted to search for gold deposits in and around ancient/modern mine workings. So far traditional exploration has been done following surface out crops and old workings. It is time to unravel the hidden deposits in virgin areas, by application of sophisticated methodology, equipment and technology. One such method is a conceptual exploration by geological modelling. For this, reinterpretations of available geo-data are essential (Geology, Structure, Geochemistry, Geophysics, Exploration etc.) to study the structure and genetic mode of mineralization, which will be helpful in locating new ore deposits in the vicinity.

The available geo-data to be reinterpreted, other information to be organized, basic criteria characteristics of mineralization has to be recognized. A shift in the basic approach from conventional "Prospect" oriented approach to "Prospect in the regional Geological setting approach to be studied." Geo-modelling of the geo-data and by analysis, synthesis of case studies may yield more information to locate a new auriferous zones.

Small scale mining and satellite gold mines development should be carried out to the existing gold mining complex, which will attain the production stage with minimum gestation period from exploration to mining as there are several small, marginal grade and narrow

width gold deposits, which cannot be worked independently. This type of development will uplift the socio-economic condition, infrastructure development, skill development and employment opportunities to the rural backward areas.

Geotourism Hub and Geo Industrial park to surround the newly developed revived KGF mine being proposed by the state with the ex-workforce: KGF area is known for its ecological and for social-cultural diversity. The proposal of developing KGF as an educational Geotourism center forming an integral part of the larger Geo-park theme needs serious considerations. A museum showcasing aspects of ancient to modern mining methods and objects

would be a desirable attraction to tourists, visual appeal, educative value, scientific importance, social, cultural significance, tourist and students. There are verdant green forests and semi-tribal settlements, modern horticultural ventures and admirable temples, architecture in and around KGF, Hutti, Gadag, Ramgiri Gold Mines etc. The tourist attraction added can be great.

During 1894, the production of gold in Karnataka was 5.3 tonnes, when the sale price of gold was Rs. 2.50 per gram. The production was stepped up and reached a peak production of 14.7 tonnes in the year 1906. The present production is around 1.8 tonnes per year. The best opportune time for significantly stepping up the

exploration and production is now for the fact that gold is enjoying an all-time high market.

Ambition has to be stirred in young minds to reach out boldly and tirelessly, towards success in the large tasks awaiting enterprising Geologists/Mining Engineers/Metallurgists/ Researchers. It is wrong to stand still and stagnate when opportunities are present for making immense progress through new discoveries (Radhakrishna and Curtis 1999).

The big process of exploration, discovering, developing and establishing new gold mines in the country should receive serious consideration at all level of decision making.

#### ACKNOWLEDGEMENTS:

The data/ information gathered by other agencies were necessary to present a comprehensive review attempted in this note. The author wishes to thank the authors of such reprints/paper /notes and reports. The author thanks the reviewers.

#### NOTES

- Views expressed here are the authors, not necessarily the organization where he is working and worked.
- The information and expressions of opinions contained in this paper are not intended to be a comprehensive study, nor to provide actuarial advice or advice of any nature and should be not to be treated as a substitute for a specific judgement.

#### BIBLIOGRAPHY

- Biswas, S.K (1991): Geological characteristics and timing of gold mineralization in Hutti-Maski greenstone belt, India. BRAZIL Gold 91. E.A. Ladeira (Ed). Balkema Publication. Pp. 187 – 189.
- Pal Nabarun and Mishra. B (2002): Alteration geochemistry & fluid inclusion characteristics of the greenstone-hosted gold deposit of Hutti, Eastern Dharwar Craton, India. Mineralium Deposita, 37:722-736.
- Pandalai H.S, Jadhav. G.N, Mathew. B, Panchapakeson, Raju. K.K, Patil M.L (2003): Dissolution channels in quartz and role of pressure changes in gold and sulphide deposition in the Archaean greenstone hosted, Hutti gold deposit, Karnataka, India. Mineralium Deposita, 38: 597-624.
- Radhakrishna, B.P and Curtis. L.C (1999) Gold in India: Geol. Soc. India. 307 p.
- Raghunandan. K.R & Vidyadharan. K.T (1993): A status note on the geology along the Kolar-Raichur-Geotransect. Memoir. Geol. Soc. India. No: 25, pp: 69 – 89.
- Rogers, A.J, Kolb, J and Meyer, F.M (2003): The tectono-magmatic evolution of the Hutti-Maski Greenstone Belt and relative timing of gold mineralization. Applied Earth Science (Trans. Inst. Min. Metall. B) August 2003.
- Roy.A(1979): Polyphase folding deformation in the Hutti-Maski belt, Karnataka. Jour. Geol. Soc. Ind. 20; 598 – 607.
- Sahoo Ajit Kumar, Krishnamurthi. R and Sangurmath Prabhakar(2016) : Auriferous Lode of Hira- Buddinni Gold Mine, Hutti- Maski Schist Belt, Dharwar Craton : Mineralogy, Alteration, Types and Mechanism of Vein Emplacement, Journ. Geo. Soc. Ind, Vol.88, pp 675 – 684.
- Sangurmath Prabhakar & Raju P.V.S (2017): Scheelite bearing veins with enrichment of light rare earth elements (LREE's) from Hutti Gold Mines, Eastern Dharwar Craton, Indian Journal of Appl. Geochem, Vol. 19, No.2. pp. 203 – 207.
- Sangurmath Prabhakar (1996): Status of Gold Exploration Hot spots in Hutti - Maski Greenstone belt, Karnataka, India. Gold Resources of India, NGRI Hyderabad, pp 53 - 59.
- Sangurmath Prabhakar (2001): Uti Gold Deposit-Evolving scene, Hutti-Maski greenstone belt, India. Geol.Surv.Ind.Spl.pub no: 58 pp: 289-292.
- Sangurmath Prabhakar (2003): Detailed exploration for epigenetic Gold Deposit: A Case History: Hira-Buddinni Gold Deposit. Hutti-Maski schist belt, India. Mining in the 21st Century Quo Vadis? Eds: Ghose A.K & Bose. L.K, 19th WMC, New Delhi, pp: 315-329.

- Sangurmath Prabhakar (2003): The Geology Setting Structure and Gold Mineralisation of Uti open-cast Mine, Hutti – Maski Greenstone belt, Karnataka. Mining Engineers Journal, Vol: 5(1), pp: 19-21.
- Sangurmath Prabhakar(2015): Geology, Gold Mineralization and Exploration of Mangalur Gold Mine, Yadgir Dist, Karnataka, India. Journ Economic Geology & Geo Resource Management, Vol. 10, pp 103-110.
- Sangurmath Prabhakar, (2005): Geology and Gold mineralization of the Buddinni gold deposit, Hutti-Maski greenstone belt, Karnataka. Jour. Geol. Soc.India, Vol. 66, No. 5, 552 - 560.
- Sarma D. Srinivasa, Ian R. Fletcher, Birger Rasmussen, Neal J. McNaughton M. Ram Mohan and David I. Groves (2011) Achaean gold mineralization synchronous with late cratonization of the Western Dharwar Craton, India: 2.52 Ga U–Pb ages of hydrothermal monazite and xenotime in gold deposits. Mineralium Deposita v. 46: 273-288
- Sarma D. Srinivasa, Neal McNaughton, I.R. Fletcher, D.I. Groves, M. Ram Mohan and V. Balaram (2008) The Timing of gold mineralization of Hutti gold deposit, Dharwar Craton, South India. Economic Geology, v.103-8, pp.1715-1727.
- Sawkar R. H., Rahul Baldota, S. R. Suresh, P.T. Sastry, A. S. Kulgeri, B.R. Nagabhushan, D. S. Sarma, D. V. Subba Rao, S. Nirmal Charan and S. M. Naqvi (1999) Exploitation, Mine Development and Pilot Plant at Gadag Gold Field, Karnataka, India. Journal of Geological Society of India. V.54, pp.322-326.
- Shekar. N.C, Srivastava. S.C and Desai. B.G(1996): Review of Gold Exploration work carried out by MECL. Gold Resources of India, NGRI, pp-19.
- Srikantia, S.V. (1995): Geology of the Hutti - Maski greenstone belt, In: Curtis.L.C., Radhakrishana. B.P(eds) Hutti Gold Mine - into the 21st Century. Geol. Soc. India, pp 8-27.
- Subba Rao D.V. et.al & Prabhakar Sangoomath(2015): Major, Trace and REE Characteristics of the High Grade Gold Geochemical Reference Material from Middle Reef, Hutti Gold Mines, Karnataka. Jour. Geol. Soc.India. Vol 85(3).6h
- Vasudev, V.N, (2020): Suggestions to Make Mineral Resources Development Highly Attractive to Private Investments. Geonesis, Vol:7, Issue:7, June 2020, pp:2-18.
- Vasudev, V.N, Chadwick. B, Nutman, A.P, Hegde, G.V (2000) Rapid development of the late Archean Hutti schist belt, northern Karnataka: implications of new field data and SHRIMP U/pb zircon ages. Jour. Geol. Soc. India. 55: 529-540.
- Ziauddin. M. & Narayanaswami. S (1974): Gold resources of India. Geol. Surv. India. Bull No: 38, Part - II.

Intentionally kept blank

# STATISTICS

KEY ECONOMIC  
INDICATORS

# ECONOMIC INDICATORS

Key Economic Indicators						
Indicator	Unit	2015-16	2016-17	2017-18	2018-19	2019-20 (P)
<b>National Income Aggregates</b>						
Gross Domestic Product (current market prices) base = 2011-12	Rs. Crore	13771874	15362386	17098304	18971237	20339849
Growth Rate	%	10.6	10.8	11.3	11.0	7.2
Gross Domestic Product (constant market prices) base = 2011-12	Rs. Crore	11369493	12298327	13175160	13981426	14565951
Growth Rate	%	8.1	7.1	7.2	6.1	4.2
Gross Fixed Capital Formation (% to GDP)	%	30.3	28.2	30.8	31.9	29.8
Per Capita Net National Income (at current prices)	Rs	94797	104659	115293	126521	134226
<b>Output</b>						
Foodgrains	Mn tonnes	251.54	275.11	285.01	285.21	295.67
Index of Industrial Production (growth)	%	3.3	4.6	4.4	3.8	-0.8
Electricity Generation (growth)	%	5.7	5.8	5.4	5.2	1.0
<b>Prices Trends</b>						
Inflation WPI	%	-3.7	1.7	3.0	4.3	1.7
Inflation CPI	%	4.9	4.5	3.6	3.4	4.8
<b>External Sector</b>						
Export Growth (USD)	% change	-15.9	5.2	10.3	9.1	-5.0
Import Growth (USD)	% change	-14.1	-1.0	19.5	10.3	-7.6
Current Account Balance (CAB)/GDP	%	-1.1	-0.6	-1.9	-2.0	-0.9
Foreign Exchange Reserves	USD Billion	360	370	425	413	442
<b>Money and Credit</b>						
Broad Money (M3)	% change	10.1	10.1	9.2	10.5	8.9
Scheduled Commercial Bank Credit	Rs Billion	72496	78415	86254	97717	103709
(Growth %)	% change	10.9	8.2	10.0	13.3	6.1
<b>Fiscal Indicators (Centre)</b>						
Gross Fiscal Deficit	% of GDP	3.9	3.5	3.5	3.4	3.8
Revenue Deficit	% of GDP	2.5	2.1	2.6	2.4	2.4
Primary Deficit	% of GDP	0.7	0.4	0.4	0.4	0.7

P: Provisional Estimates | Note: Data updated till September 30, 2020

Source: Central Statistical Organisation (CSO), Reserve Bank of India (RBI), Ministry of Agriculture, GoI, Economic Survey, India Budget

GROWTH TRENDS IN SECTORAL GROSS VALUE ADDED AND GDP AT 2011-12 PRICES (%)					
Industry	2015-16	2016-17	2017-18	2018-19	2019-20 (P)
Agriculture, forestry & fishing	0.7	6.3	5.0	2.4	4.0
Mining & quarrying	10.5	13.0	5.1	-5.8	3.1
Manufacturing	10.8	7.9	5.9	5.7	0.0
Electricity, gas, water supply & other utility services	5.0	9.2	8.6	8.2	4.1
Construction	5.0	1.3	5.6	6.1	1.3
Trade, hotels, transport, communication and services related to broadcasting	10.5	7.2	7.8	7.7	3.6
Financial, real estate & professional services	10.8	6.0	6.2	6.8	4.6
Public Administration, defence and other services	6.9	10.7	11.9	9.4	10.0
GVA at basic prices	7.9	7.1	6.9	6.0	3.9
GDP at Market Prices	8.0	7.1	7.2	6.1	4.2

P: Provisional Estimates | Note: Data updated till September 30, 2020

Source: Central Statistical Organisation (CSO)



# ECONOMIC INDICATORS

MONEY SUPPLY (₹ BILLION)					
Indicator	2015-16	2016-17	2017-18	2018-19	2019-20
Currency with the public	15973	12641	17597	20522	23497
Deposit Money of the Public	10053	14178	15076	16581	17762
M1	26025	26820	32673	37103	41259
Post Office Savings Deposits	616	921	1028	1406	1418
M2	26641	27740	33701	37117	42677
Time Deposits with Banks	90151	101100	106953	117206	126740
M3	116176	127919	139626	154309	167999
Total Post Office Deposits	2084	2562	2881	3673	4092
M4	118260	130481	142507	154345	172092

Source: Reserve Bank of India

FOREIGN EXCHANGE RESERVES (IN BILLION)						
End of Financial Year		2015-16	2016-17	2017-18	2018-19	2019-20
Foreign Currency Assets	(Rupees)	22190.6	22449.4	25975.7	26655.6	33338.2
	(US Dollar)	336.1	346.3	399.4	385.4	442.2
Gold	(Rupees)	1334.3	1288.3	1397.4	1595.8	2305.3
	(US Dollar)	20.1	19.9	21.5	23.1	30.6
Reserve Tranch Position	(Rupees)	162.9	150.5	135.2	206.6	270.1
	(US Dollar)	2.5	2.3	2.1	3.0	3.6
SDRs	(Rupees)	99.6	93.8	100.2	100.8	108.0
	(US Dollar)	1.5	1.4	1.5	1.5	1.4
Total	(Rupees)	23787.4	23982.0	27608.5	28558.8	36021.6
	(US Dollar)	360.2	370.0	424.5	412.9	477.8

Source: RBI

KEY COMPONENTS OF INDIA'S EXTERNAL SECTOR (USD MILLION)					
Indicator	2015-16	2016-17	2017-18	2018-19	2019-20(P)
I. Merchandise - Exports, f.o.b.	266365	280138	308970	337237	320431
I. Merchandise - Imports, c.i.f.	396444	392580	469006	517519	477937
I. Trade balance	-130079	-112442	-160036	-180283	-157506
Services, net	69676	67455	77562	81941	84922
II. Invisibles, net	107928	97146	111319	123026	132850
III. Current account balance (CAB)	-22151	-15295	-48717	-57256	-24656
CAB as per cent to GDP	-1.1	-0.6	-2	-2.0	-0.9
IV. Capital account	40055	36482	91390	54403	83180
A) Foreign Investment	41264	43224	52401	30094	44417
FDI	36021	35612	30286	30712	43013
Portfolio	-4130	7612	22115	-2400	1403
B) External assistance, net	1966	2013	2944	3413	3751
C) Commercial borrowings, net	-5856	-6101	-183	10416	22960
D) Rupee debt service	-73	-99.34	-75	-31	-69
F) Other capital	-13297	7594	6213	1057	18462
V. Overall balance	17905	21550	43574	-3339	59498

Source: RBI

# ECONOMIC INDICATORS

WHOLESALE PRICE INDEX (BASE = 2011-12)- ANNUAL AVERAGE INFLATION RATES (%)						
Description	Weight	2015-16	2016-17	2017-18	2018-19	2019-20
<b>All Commodities</b>	<b>100.0</b>	<b>-3.7</b>	<b>1.7</b>	<b>3.0</b>	<b>4.3</b>	<b>1.7</b>
<b>Primary Articles</b>	<b>22.6</b>	<b>-0.4</b>	<b>3.5</b>	<b>1.3</b>	<b>2.8</b>	<b>6.8</b>
Food Articles	15.3	2.6	4.0	2.1	0.3	8.4
Non-Food Articles	4.1	2.7	3.4	-2.1	2.9	4.5
Minerals	0.8	-11.0	7.1	8.3	11.4	13.2
Crude Petroleum & Natural Gas	2.4	-26.0	-4.6	-0.1	26.6	-7.7
Crude Petroleum	1.9	-36.0	4.8	1.9	29.7	-12.7
Natural Gas	0.5	3.0	-21.2	-5.3	18.6	6.6
<b>Fuel &amp; Power</b>	<b>13.2</b>	<b>-19.7</b>	<b>-0.2</b>	<b>8.1</b>	<b>11.6</b>	<b>-1.8</b>
Mineral Oils	7.9	-32.0	-0.8	12.6	17.2	-4.6
<b>Manufactured Products</b>	<b>64.2</b>	<b>-1.8</b>	<b>1.4</b>	<b>2.8</b>	<b>3.6</b>	<b>0.3</b>

Source: Estimated from the Indices published on [www.eaindustry.nic.in](http://www.eaindustry.nic.in)

CONSUMER PRICE INDEX (BASE=2012) - ANNUAL AVERAGE INFLATION RATES (%)						
Description	Weight	2015-16	2016-17	2017-18	2018-19	2019-20
Rural	100.0	5.6	5.0	3.6	3.0	4.3
Urban	100.0	4.1	4.0	3.6	3.9	5.4
Combined	100.0	4.9	4.5	3.6	3.4	4.8

Source: Estimated from the Indices published by CSO

INDEX OF INDUSTRIAL PRODUCTION (BASE=2011-12) - ANNUAL GROWTH RATES (%)						
Description	Weights	2015-16	2016-17	2017-18	2018-19	2019-20
Mining	14.4	4.3	5.3	2.3	2.9	1.6
Manufacturing	77.6	2.8	4.4	4.6	3.9	-1.4
Electricity	8.0	5.7	5.8	5.4	5.2	1.0
General	100.0	3.3	4.6	4.4	3.8	-0.8
<b>Use-based Category</b>						
Primary goods	34.0	5.0	4.9	3.7	3.5	0.7
Capital goods	8.2	3.0	3.2	4.0	2.7	-13.9
Intermediate goods	17.2	1.5	3.3	2.3	0.9	9.1
Infrastructure/ construction goods	12.3	2.8	3.9	5.6	7.3	-3.6
Consumer durables	12.8	3.4	2.9	0.8	5.5	-8.7
Consumer non-durables	15.3	2.6	7.9	10.6	4.0	-0.1

Source: CSO

ALL INDIA INDEX NUMBERS OF AREA AND PRODUCTION OF PRINCIPAL CROPS (BASE : TRIENNIUM ENDING 2007-08= 100)											
Crop	Weight	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19 *
<b>All India Index Numbers of Area of Principal Crops</b>											
Foodgrains	51	100	104	104	102	106	105	104	109	107	105
Cereals	42	100	102	103	102	104	106	103	105	102	100
Pulses	9	102	116	108	104	113	104	109	130	132	127
Non Foodgrains	49	104	114	116	116	119	119	120	116	118	117
Oilseeds	13	95	101	98	98	104	94	95	97	91	95
Cotton	4	112	124	134	132	132	141	135	119	139	139
All Crops	100	102	109	110	109	112	112	112	113	113	111
<b>All India Index Numbers of Production of Principal Crops</b>											
Foodgrains	51	101	114	120	119	123	116	116	131	137	135
Cereals	42	100	111	119	117	121	115	116	124	127	128
Pulses	9	102	129	122	129	136	122	117	166	182	168
Non Foodgrains	49	105	128	130	129	136	132	126	135	142	138
Oilseeds	13	89	117	107	107	119	100	93	111	115	114
Cotton	4	108	148	158	153	161	156	134	146	147	129
All Crops	100	103	121	125	124	130	124	121	133	139	137

\* Agricultural Crops as per 4th Advance Estimates and Horticultural Crops as per 3rd Advance Estimates

Source: Economic Survey 2019-20

# ECONOMIC INDICATORS

SCHEDULED COMMERCIAL BANKS CREDIT OUTSTANDING (RS CRORE)						
	Bank credit	Growth (%)	Food credit	Growth (%)	Non-food credit	Growth (%)
Apr-15	6575199.2	9.3	87126.0	-6.0	6488073.2	9.6
May-15	6606343.6	9.3	116538.0	0.0	6489805.6	9.5
Jun-15	6630624.0	8.8	111435.0	-2.6	6519189.0	9.0
Jul-15	6627976.5	8.9	108566.0	-3.5	6519410.5	9.2
Aug-15	6638819.4	9.1	102682.0	-4.7	6536137.4	9.3
Sep-15	6685891.5	9.3	102739.0	-2.2	6583152.5	9.5
Oct-15	6794625.9	8.8	102449.0	-6.0	6692176.9	9.1
Nov-15	6839153.6	9.3	108926.0	1.3	6730227.6	9.5
Dec-15	6988248.5	10.6	111005.0	2.5	6877243.5	10.7
Jan-16	7055477.4	10.9	102187.0	-0.8	6953290.4	11.1
Feb-16	7144778.5	11.2	107782.0	8.1	7036996.5	11.2
Mar-16	7249614.9	10.9	105253.0	11.5	7144361.9	10.9
Apr-16	7232294.7	10.0	104069.0	19.4	7128225.7	9.9
May-16	7226441.5	9.4	110661.0	-5.0	7115780.5	9.6
Jun-16	7227960.4	9.0	100382.0	-9.9	7127578.4	9.3
Jul-16	7240547.6	9.2	105460.0	-2.9	7135087.6	9.4
Aug-16	7247718.9	9.2	103516.0	0.8	7144202.9	9.3
Sep-16	7494868.4	12.1	85462.0	-16.8	7409406.4	12.6
Oct-16	7384413.9	8.7	102228.0	-0.2	7282185.9	8.8
Nov-16	7261753.6	6.2	91780.0	-15.7	7169973.6	6.5
Dec-16	7317391.2	4.7	105064.0	-5.4	7212327.2	4.9
Jan-17	7389528.2	4.7	104013.0	1.8	7285515.2	4.8
Feb-17	7458849.6	4.4	105541.0	-2.1	7353308.6	4.5
Mar-17	7841466.0	8.2	53927.0	-48.8	7787539.0	9.0
Apr-17	7582390.7	4.8	55681.0	-46.5	7526709.7	5.6
May-17	7569458.4	4.7	60701.0	-45.1	7508757.4	5.5
Jun-17	7819807.0	8.2	50890.0	-49.3	7768917.0	9.0
Jul-17	7670218.9	5.9	54721.0	-48.1	7615497.9	6.7
Aug-17	7691194.4	6.1	47943.0	-53.7	7643251.4	7.0
Sep-17	7983437.5	6.5	46368.0	-45.7	7937069.5	7.1
Oct-17	7884644.9	6.8	62225.0	-39.1	7822419.9	7.4
Nov-17	7934714.6	9.3	74375.0	-19.0	7860339.6	9.6
Dec-17	8179460.0	11.8	58458.0	-44.4	8121002.0	12.6
Jan-18	8147188.7	10.3	54429.0	-47.7	8092759.7	11.1
Feb-18	8237448.0	10.4	45817.0	-56.6	8191631.0	11.4
Mar-18	8625424.9	10.0	41989.0	-22.1	8583435.9	10.2
Apr-18	8517625.1	12.3	52035.0	-6.5	8465590.1	12.5
May-18	8537655.4	12.8	52910.0	-12.8	8484745.4	13.0
Jun-18	8672807.1	10.9	59300.0	16.5	8613507.1	10.9
Jul-18	8616227.0	12.3	50876.0	-7.0	8565351.0	12.5
Aug-18	8780752.8	14.2	48854.0	1.9	8731898.8	14.2
Sep-18	8981664.0	12.5	47663.0	2.8	8934001.0	12.6
Oct-18	9033975.2	14.6	55034.0	-11.6	8978941.2	14.8
Nov-18	9221897.7	16.2	79830.0	7.3	9142067.7	16.3
Dec-18	9319764.9	13.9	75685.0	29.5	9244079.9	13.8
Jan-19	9351200.9	14.8	68791.0	26.4	9282409.9	14.7
Feb-19	9449740.2	14.7	59314.0	29.5	9390426.2	14.6
Mar-19	9771722.4	13.3	41610.0	-0.9	9730112.4	13.4
Apr-19	9620945.5	13.0	43161.0	-17.1	9577784.5	13.1
May-19	9621545.0	12.7	65722.0	24.2	9555823.0	12.6
Jun-19	9648768.3	12.0	71419.0	14.2	9577349.3	12.0
Jul-19	9658377.7	12.2	66001.0	30.3	9592376.7	12.1
Aug-19	9680153.4	10.2	62392.0	27.7	9617761.4	10.1
Sep-19	9768853.9	8.8	60085.0	26.1	9708768.9	8.7
Oct-19	9840562.3	8.9	69778.0	26.8	9770784.3	8.8
Nov-19	9860302.6	8.0	91304.0	26.3	9768998.6	7.8
Dec-19	9947443.9	7.1	85143.0	10.1	9862300.9	7.1
Jan-20	10105176.4	8.3	78899.0	11.2	10026277.4	8.3
Feb-20	10104866.3	7.0	65596.0	6.2	10039270.3	7.0
Mar-20	10370860.7	6.1	51763.0	24.4	10319097.7	6.1

As on the last reporting Friday of the corresponding month

Source: Database on Indian Economy, RBI

# ECONOMIC INDICATORS

ALL INDIA PRODUCTION ESTIMATES FOR FOODGRAINS (MILLION TONNES)						
Crop	Season	2015-16	2016-17	2017-18	2018-19	2019-20#
Rice	Kharif	91.4	96.3	97.1	102.0	101.7
	Rabi	13.0	13.4	15.6	14.4	16.2
	Total	104.4	109.7	112.8	116.5	117.9
Wheat	Rabi	92.3	98.5	99.9	103.6	107.2
Maize	Kharif	16.1	18.9	20.1	19.4	20.2
	Rabi	6.5	7.0	8.6	8.3	8.8
	Total	22.6	25.9	28.8	27.7	29.0
Barley	Rabi	1.4	1.8	1.8	1.6	1.6
Coarse Cereals	Kharif	28.2	32.4	34.0	31.4	34.2
	Rabi	10.4	11.3	12.9	11.7	13.3
	Total	38.5	43.8	47.0	43.1	47.5
Cereals	Kharif	119.6	128.7	131.2	133.4	135.9
	Rabi	115.7	123.2	128.4	129.7	136.8
	Total	235.2	252.0	259.6	263.1	272.7
Tur (Arhar)	Kharif	2.6	4.9	4.3	3.3	3.8
Gram	Rabi	7.1	9.4	11.4	9.9	10.9
Pulses	Kharif	5.5	9.6	9.3	8.1	8.1
	Rabi	10.8	13.6	16.1	14.0	15.0
	Total	16.3	23.1	25.4	22.1	23.0
Foodgrains	Kharif	125.1	138.3	140.5	141.5	144.0
	Rabi	126.5	136.8	144.6	143.7	151.7
	Total	251.5	275.1	285.0	285.2	295.7

Source: Ministry of agriculture, Govt | # Third Advance Estimates

ALL INDIA PRODUCTION ESTIMATES FOR OILSEEDS AND COMMERCIAL CROPS (LAKH TONNES)						
Crop	Season	2015-16	2016-17	2017-18	2018-19	2019-20#
Groundnut	Kharif	53.7	60.5	76.0	53.9	78.1
	Rabi	13.7	14.1	16.6	13.4	15.4
	Total	67.3	74.6	92.5	67.3	93.5
Castorseed	Kharif	17.5	13.8	15.7	12.0	20.6
Sesamum	Kharif	8.5	7.5	7.6	6.9	7.5
Nigerseed	Kharif	0.7	0.9	0.7	0.5	0.7
Soyabean	Kharif	85.7	131.6	109.3	132.7	122.4
Sunflower	Kharif	0.9	1.1	0.9	0.9	0.8
	Rabi	2.1	1.4	1.4	1.3	1.3
	Total	3.0	2.5	2.2	2.2	2.0
Rapeseed & Mustard	Rabi	68.0	79.2	84.3	92.6	87.0
Linseed	Rabi	1.3	1.8	1.7	1.0	1.0
Safflower	Rabi	0.5	0.9	0.6	0.3	0.3
Total Oilseeds	Kharif	167.0	215.3	210.1	206.8	230.1
	Rabi	85.5	97.5	104.5	108.5	105.0
	Total	252.5	312.8	314.6	315.2	335.0
Sugarcane	Total	3484.5	3060.7	3799.1	4054.2	3581.4
Cotton@	Total	300.1	325.8	328.1	280.4	360.5

@ Thousand bales of 170 kgs each. | # Third Advance Estimates

Source: Ministry of agriculture, Govt

# ECONOMIC INDICATORS

## CONVERSION FACTORS BETWEEN IMPORTANT PRIMARY AND SECONDARY AGRICULTURAL COMMODITIES

Commodity	Conversion Factor
<b>Cotton</b>	
Cotton lint production	1/3 of Kapas Production
Cotton seed production	2/3 of Kapas Production 2 Times of Cotton Lint Production
<b>Rapeseed and Mustard</b>	
Oil to seeds crushed	33 Per cent
Cake to seeds crushed	67 Per cent
<b>Castorseed</b>	
Oil to seeds crushed	37 Per cent
Cake to seeds crushed	63 Per cent
<b>Soyabean Seed</b>	
Oil to soyabean seed crushed	18 Per cent
Meal to soyabean seed crushed	73 Per cent
Hull from soyabean seed crushed	8 Per cent
Wastage from soyabean seed crushed	1 Per cent
<b>Sugar</b>	
Gur from cane crushed	11.20 Per cent to 11.50 Per cent
Crystal sugar from gur refined (gur refineries)	62.5 Per cent
Crystal sugar from cane Crushed (cane factories)	10.20 Per cent
Khandasari sugar (Sulphur and Non-sulphur) from standard gur refined	46 Per cent
Molasses from cane crushed	4.0 Per cent to 4.5 Per cent
Cane - trash from cane harvested	8.0 Per cent to 12.0 Per cent

Source: Department of Agriculture and Cooperation

## CROP GROWTH CALENDAR (INDIA)

Crop	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wheat												
Rice												
Corn												
Chana												
Tur												
Guarseed												
Sugarcane												
Potato (Northern India)												
Mentha												
Cotton												
Turmeric												
Chillies												
Jeera												
Soy												
Rapeseed												
Coffee												
Cardamom												
Pepper												
<b>Sowing</b>	<b>Growth</b>	<b>Harvesting</b>										

Source: www.agmarknet.nic.in, Spices Board of India, Coffee Board of India

# ECONOMIC INDICATORS

ALL-INDIA LAND USE PATTERN (000 HECTARES)					
	2011-12	2012-13	2013-14	2014-15	2015-16*
Geogra-phical Area	328726	328726	328726	328726	328726
Reported area for land utilisation statistics	307392	307491	307797	307781	307752
Forests	71599	71571	71828	71756	71866
<b>Net area Sown</b>	<b>140980</b>	<b>139934</b>	<b>141426</b>	<b>140128</b>	<b>139506</b>
<b>Total Cropped Area</b>	<b>195796</b>	<b>194219</b>	<b>200951</b>	<b>198378</b>	<b>197054</b>
Cultivated land	155492	155226	155582	155219	154916
<b>Net Irrigated Area</b>	<b>65707</b>	<b>66287</b>	<b>68117</b>	<b>68384</b>	<b>67300</b>
Gross Irrigated Area	91786	92244	95759	96754	96622
Percentage of Gross Irrigated Area to Cropped Area	47	47	48	49	49
Cropping Intensity (%)	139	139	142	142	141

Source: Department of Agriculture, Govt. | \* Provisional

ALL-INDIA LAND USE PATTERN (000 HECTARES)					
State	2011-12	2012-13	2013-14	2014-15	2015-16*
<b>ANDHRA PRADESH</b>					
Geogra-phical Area	27507	27507	16020	16276	16297
Reported area for land utilisation statistics	27505	27505	16020	16276	16297
Forests	6230	6227	3493	3663	3688
Net area Sown	11161	11117	6448	6236	6209
Total Cropped Area	13759	13650	8128	7690	7532
Cultivated land	13434	13454	7536	7638	7619
Net Irrigated Area	5090	4575	3014	2927	2743
Gross Irrigated Area	6785	6268	4095	3886	3547
Percentage of Gross Irrigated Area to Cropped Area	49	46	50	51	47
Cropping Intensity (%)	123	123	126	123	121
<b>TELANGANA (formed in 2013-14)</b>					
Geogra-phical Area			11487	11231	11210
Reported area for land utilisation statistics			11484	11208	11208
Forests			2743	2540	2540
Net area Sown			4961	4377	4175
Total Cropped Area			6288	5315	4893
Cultivated land			5921	5777	5753
Net Irrigated Area			2289	1726	1486
Gross Irrigated Area			3164	2529	2028
Percentage of Gross Irrigated Area to Cropped Area			50	48	41
Cropping Intensity (%)			127	121	117
<b>ASSAM</b>					
Geogra-phical Area	7844	7844	7844	7844	7844
Reported area for land utilisation statistics	7850	7844	7844	7844	7844
Forests	1853	1855	1853	1853	1853
Net area Sown	2811	2809	2820	2827	2801
Total Cropped Area	4174	4076	4100	4083	4060
Cultivated land	2891	2897	2906	2915	2896
Net Irrigated Area	161	321	303	296	297
Gross Irrigated Area	163	378	375	374	388
Percentage of Gross Irrigated Area to Cropped Area	4	9	9	9	10
Cropping Intensity (%)	149	145	145	144	145
<b>BIHAR</b>					
Geogra-phical Area	9416	9416	9416	9416	9416
Reported area for land utilisation statistics	9360	9360	9360	9360	9360
Forests	622	622	622	622	622

# ECONOMIC INDICATORS

<b>ALL-INDIA LAND USE PATTERN (000 HECTARES)</b>					
<b>State</b>	<b>2011-12</b>	<b>2012-13</b>	<b>2013-14</b>	<b>2014-15</b>	<b>2015-16*</b>
Net area Sown	5396	5402	5252	5278	5205
Total Cropped Area	7647	7778	7580	7673	7572
Cultivated land	6177	6169	6166	6167	6166
Net Irrigated Area	3052	3053	2933	2987	2958
Gross Irrigated Area	5158	5327	5145	5268	5247
Percentage of Gross Irrigated Area to Cropped Area	67	68	68	69	69
Cropping Intensity (%)	142	144	144	145	145
<b>CHHATTISGARH</b>					
Geogra-phical Area	13519	13519	13519	13519	13519
Reported area for land utilisation statistics	13790	13790	13790	13790	13790
Forests	6352	6352	6331	6316	6314
Net area Sown	4677	4671	4686	4681	4651
Total Cropped Area	5664	5691	5698	5728	5640
Cultivated land	4947	4928	4946	4948	4932
Net Irrigated Area	1415	1449	1462	1468	1476
Gross Irrigated Area	1648	1725	1751	1787	1753
Percentage of Gross Irrigated Area to Cropped Area	29	30	31	31	31
Cropping Intensity (%)	121	122	122	122	121
<b>GUJARAT</b>					
Geogra-phical Area	19602	19602	19602	19602	19602
Reported area for land utilisation statistics	19069	19069	19069	19069	19069
Forests	1834	1834	1834	1834	1834
Net area Sown	10302	10302	10302	10302	10302
Total Cropped Area	13086	12600	12487	12773	11522
Cultivated land	10681	10681	10681	10681	10681
Net Irrigated Area	4233	4233	4233	4233	4233
Gross Irrigated Area	6305	5913	5939	6014	6037
Percentage of Gross Irrigated Area to Cropped Area	48	47	48	47	52
Cropping Intensity (%)	127	122	121	124	112
<b>HARYANA</b>					
Geogra-phical Area	4421	4421	4421	4421	4421
Reported area for land utilisation statistics	4371	4371	4371	4371	4371
Forests	39	40	39	38	41
Net area Sown	3513	3513	3497	3522	3522
Total Cropped Area	6489	6376	6471	6536	6510
Cultivated land	3641	3616	3598	3608	3615
Net Irrigated Area	3073	3102	2931	2974	2956
Gross Irrigated Area	5680	5672	5708	5824	5948
Percentage of Gross Irrigated Area to Cropped Area	88	89	88	89	91
Cropping Intensity (%)	185	182	185	186	185
<b>HIMACHAL PRADESH</b>					
Geogra-phical Area	5567	5567	5567	5567	5567
Reported area for land utilisation statistics	4576	4576	4576	4577	4577
Forests	1126	1124	1126	1127	1127
Net area Sown	550	548	549	548	551
Total Cropped Area	932	934	940	918	933
Cultivated land	604	607	606	603	605
Net Irrigated Area	113	114	114	117	120
Gross Irrigated Area	198	201	197	190	206
Percentage of Gross Irrigated Area to Cropped Area	21	22	21	21	22
Cropping Intensity (%)	169	170	171	167	169

# ECONOMIC INDICATORS

<b>ALL-INDIA LAND USE PATTERN (000 HECTARES)</b>					
<b>State</b>	<b>2011-12</b>	<b>2012-13</b>	<b>2013-14</b>	<b>2014-15</b>	<b>2015-16*</b>
<b>JHARKHAND</b>					
Geogra-phical Area	7972	7972	7972	7972	7972
Reported area for land utilisation statistics	7970	7970	7970	7970	7970
Forests	2239	2239	2239	2239	2239
Net area Sown	1250	1406	1384	1385	1386
Total Cropped Area	1430	1657	1672	1554	1812
Cultivated land	2782	2846	2829	2770	2796
Net Irrigated Area	153	210	217	207	213
Gross Irrigated Area	162	235	238	221	235
Percentage of Gross Irrigated Area to Cropped Area	11	14	14	14	13
Cropping Intensity (%)	114	118	121	112	131
<b>KARNATAKA</b>					
Geogra-phical Area	19179	19179	19179	19179	19179
Reported area for land utilisation statistics	19050	19050	19050	19052	19050
Forests	3072	3073	3073	3073	3073
Net area Sown	9941	9793	9923	10044	10006
Total Cropped Area	12059	11748	12267	12247	12009
Cultivated land	11613	11615	11623	11615	11460
Net Irrigated Area	3440	3421	3556	3589	3243
Gross Irrigated Area	4137	4007	4112	4186	3742
Percentage of Gross Irrigated Area to Cropped Area	34	34	34	34	31
Cropping Intensity (%)	121	120	124	122	120
<b>KERALA</b>					
Geogra-phical Area	3886	3886	3886	3886	3886
Reported area for land utilisation statistics	3886	3886	3886	3886	3886
Forests	1082	1082	1082	1082	1082
Net area Sown	2040	2048	2051	2043	2023
Total Cropped Area	2662	2592	2617	2625	2628
Cultivated land	2117	2125	2122	2108	2093
Net Irrigated Area	409	396	397	414	414
Gross Irrigated Area	546	458	468	470	484
Percentage of Gross Irrigated Area to Cropped Area	20	18	18	18	18
Cropping Intensity (%)	130	127	128	128	130
<b>MADHYA PRADESH</b>					
Geogra-phical Area	30825	30825	30825	30825	30825
Reported area for land utilisation statistics	30756	30756	30756	30756	30756
Forests	8691	8693	8691	8694	8692
Net area Sown	15237	15352	15422	15351	15149
Total Cropped Area	22516	23130	24047	23810	23714
Cultivated land	15660	15727	15772	15740	15710
Net Irrigated Area	7887	8550	9455	9584	9284
Gross Irrigated Area	8228	8966	9919	10301	10029
Percentage of Gross Irrigated Area to Cropped Area	37	39	41	43	42
Cropping Intensity (%)	148	151	156	155	157
<b>MAHARASHTRA</b>					
Geogra-phical Area	30771	30771	30771	30771	30771
Reported area for land utilisation statistics	30758	30758	30758	30758	30758
Forests	5211	5207	5206	5201	5195
Net area Sown	17386	17344	17368	17345	17192
Total Cropped Area	22080	21943	23328	23474	23467
Cultivated land	18764	18762	18769	18744	18669



# ECONOMIC INDICATORS

<b>ALL-INDIA LAND USE PATTERN (000 HECTARES)</b>					
<b>State</b>	<b>2011-12</b>	<b>2012-13</b>	<b>2013-14</b>	<b>2014-15</b>	<b>2015-16*</b>
Net Irrigated Area	3252	3244	3248	3244	3215
Gross Irrigated Area	4173	4050	4556	4564	4736
Percentage of Gross Irrigated Area to Cropped Area	19	18	20	19	20
Cropping Intensity (%)	127	127	134	135	137
<b>ODISHA</b>					
Geogra-phical Area	15571	15571	15571	15571	15571
Reported area for land utilisation statistics	15367	15502	15467	15518	15426
Forests	5814*	5814*	5814*	5814*	5814*
Net area Sown	4394	4386	4495	4474	4198
Total Cropped Area	4964	5069	5168	5173	4803
Cultivated land	5391	5335	5372	5392	5226
Net Irrigated Area	1259	1248	1245	1259	1230
Gross Irrigated Area	1437	1496	1505	1485	1434
Percentage of Gross Irrigated Area to Cropped Area	29	30	29	29	30
Cropping Intensity (%)	113	116	115	116	114
<b>PUNJAB</b>					
Geogra-phical Area	5036	5036	5036	5036	5036
Reported area for land utilisation statistics	5033	5033	5033	5033	5033
Forests	293	262	258	256	256
Net area Sown	4134	4150	4145	4119	4137
Total Cropped Area	7905	7870	7848	7857	7872
Cultivated land	4179	4208	4200	4202	4214
Net Irrigated Area	4086	4115	4143	4118	4137
Gross Irrigated Area	7771	7744	7732	7757	7765
Percentage of Gross Irrigated Area to Cropped Area	98	98	99	99	99
Cropping Intensity (%)	191	190	189	191	190
<b>RAJASTHAN</b>					
Geogra-phical Area	34224	34224	34224	34224	34224
Reported area for land utilisation statistics	34267	34267	34267	34267	34267
Forests	2747	2750	2758	2740	2752
Net area Sown	18034	17479	18268	17521	18024
Total Cropped Area	24505	23954	26120	24235	25014
Cultivated land	19511	19348	19671	19377	19622
Net Irrigated Area	7122	7499	7650	7882	7938
Gross Irrigated Area	8903	9455	9865	10171	10562
Percentage of Gross Irrigated Area to Cropped Area	36	39	38	42	42
Cropping Intensity (%)	136	137	143	138	139
<b>TAMIL NADU</b>					
Geogra-phical Area	13006	13006	13006	13006	13006
Reported area for land utilisation statistics	13033	13033	13033	13033	13033
Forests	2125	2125	2125	2125	2157
Net area Sown	4986	4544	4714	4819	4833
Total Cropped Area	5890	5140	5897	5995	6074
Cultivated land	5953	5852	5829	5817	5822
Net Irrigated Area	2964	2643	2679	2726	2833
Gross Irrigated Area	3519	2991	3311	3394	3575
Percentage of Gross Irrigated Area to Cropped Area	60	58	56	57	59
Cropping Intensity (%)	118	113	125	124	126
<b>UTTARAKHAND</b>					
Geogra-phical Area	5348	5348	5348	5348	5348
Reported area for land utilisation statistics	5673	5673	5992	5993	5993

# ECONOMIC INDICATORS

ALL-INDIA LAND USE PATTERN (000 HECTARES)					
State	2011-12	2012-13	2013-14	2014-15	2015-16*
Forests	3485	3485	3800	3800	3800
Net area Sown	714	706	701	700	698
Total Cropped Area	1132	1124	1099	1097	1083
Cultivated land	763	757	758	757	756
Net Irrigated Area	339	338	328	330	330
Gross Irrigated Area	555	554	544	542	541
Percentage of Gross Irrigated Area to Cropped Area	49	49	49	49	50
Cropping Intensity (%)	158	159	157	157	155
UTTAR PRADESH					
Geogra-phical Area	24093	24093	24093	24093	24093
Reported area for land utilisation statistics	24170	24170	24170	24170	24170
Forests	1656	1658	1658	1659	1666
Net area Sown	16623	16564	16546	16598	16469
Total Cropped Area	25939	25821	25896	26147	26203
Cultivated land	17796	17765	17681	17720	17630
Net Irrigated Area	13809	13929	14027	14389	14231
Gross Irrigated Area	19901	20191	20403	20965	20882
Percentage of Gross Irrigated Area to Cropped Area	77	78	79	80	80
Cropping Intensity (%)	156	156	157	158	159
WEST BENGAL					
Geogra-phical Area	8875	8875	8875	8875	8875
Reported area for land utilisation statistics	8684	8684	8684	8683	8684
Forests	1174	1174	1174	1173	1174
Net area Sown	5198	5205	5234	5238	5243
Total Cropped Area	9353	9459	9618	9690	9881
Cultivated land	5597	5584	5583	5577	5571
Net Irrigated Area	3078	3082	3099	3102	3105
Gross Irrigated Area	5502	5568	5661	5700	6325
Percentage of Gross Irrigated Area to Cropped Area	59	59	59	59	64
Cropping Intensity (%)	180	182	184	185	188

Source: Department of Agriculture, Govt | \* Provisional

PERFORMANCE OF SOUTH-WEST MONSOON IN INDIA				
Year	Number of meteorological sub-divisions @		Percentage of districts with normal/ excess rainfall	Actual rainfall as % of normal rainfall (All India)
	Excess/Normal Rainfall	Deficient/Scanty Rainfall		
2012	23	13	58	92
2013	30	6	72	106
2014	24	12	55	88
2015	19	17	51	86
2016	27	9	68	97
2017	30	6	66	95
2018	24	12	62	91
2019	31	5	77	110

@ Total number of Meteorological sub-divisions was 35 upto 2001. From 2002 onwards, the number of meteorological sub-divisions is 36.

Excess : + 20% or more of Long Period Average Rainfall

Normal : Between + 19% and -19% of Long Period Average Rainfall

Deficient : Between -20% and -59% of Long Period Average Rainfall

Scanty : Between -60% and -99% of Long Period Average Rainfall

Source: Directorate of Economics and Statistics, DAC & FW

# ECONOMIC

## INDICATORS

FLOW OF INSTITUTIONAL CREDIT TO AGRICULTURE SECTOR (RS CRORE)					
Particulars/Agency	2014-15	2015-16	2016-17	2017-18	2018-19
<b>I. Production (ST) Credit</b>					
Co-operative Banks	130350	143803	131880	138348	142750
RRBs	89326	101579	105001	119546	125654
Commercial Banks	415736	419930	452576	497078	483805
<b>Sub Total</b>	<b>635412</b>	<b>665312</b>	<b>689457</b>	<b>754972</b>	<b>752209</b>
<b>II. MT/LT Credit</b>					
Co-operative Banks	8119	9492	10878	12041	9591
RRBs	13157	17681	18215	21413	24013
Commercial Banks	188640	223024	347205	380077	471017
<b>Sub Total</b>	<b>209916</b>	<b>250197</b>	<b>376298</b>	<b>413531</b>	<b>504620</b>
<b>Total Credit (ST + MT/LT)</b>					
Co-operative Banks	138469	153295	142758	150389	152340
RRBs	102483	119260	123216	140959	149667
Commercial Banks	604376	642954	799781	877155	954823
<b>Grand Total</b>	<b>845328</b>	<b>915509</b>	<b>1065755</b>	<b>1168503</b>	<b>1256830</b>

*Source: Agricultural Statistics at a Glance 2019, Ministry of Agriculture, GoI*

STATE-WISE STORAGE CAPACITY (IN LAKH METRIC TONNES)					
	2014-15	2015-16	2016-17	2017-18	2018-19
Bihar	10.49	15.1	15.56	25.81	22.1
Odisha	13.57	11.63	13.57	12.1	13.15
West Bengal	14.68	16.72	18.64	18.67	19.44
Jharkhand	2.95	2.53	2.91	3.68	5.51
Assam	5.76	6.29	3.98	4.68	3.98
Delhi	3.67	3.67	3.67	3.67	3.67
Haryana	107.77	116.11	101.73	99.17	112.2
Himachal Pradesh	0.51	0.49	0.35	0.51	0.53
Jammu & Kashmir	2.1	2.49	2.59	2.79	2.46
Punjab	240	252.56	250.13	201.43	234.3
Rajasthan	25.49	23.24	21.42	19.9	27.83
Uttar Pradesh	57.53	64.43	58.28	58.72	62.38
Uttarakhand	3.67	3.8	0.21	3.93	2.94
Andhra Pradesh	27.31	24.02	28.71	26.8	25.48
Telangana	19.79	20.88	17.52	27.37	33.42
Kerala	5.89	5.89	5.55	7.17	7.62
Karnataka	29.24	29.62	13.87	11.56	12.49
Tamil	17.58	16.99	26.97	43.17	31.31
Gujarat	9.86	9.26	8.82	9.28	10.71
Maharashtra	31.79	31.55	31.98	34.19	38.3
Madhya Pradesh	59.17	129.66	124.29	210.73	157.8
Chhattisgarh	23.58	24.98	19	15.04	24.9
All India	714.43	814.84	775.38	843.03	855.68

*"Note: Storage capacity pertains to FCI, CWC and SWC. It includes Owned and Hired, Covered and Cap Storage"*  
*Source: Agricultural Statistics at a Glance 2019, Ministry of Agriculture, GoI*

Intentionally kept blank

# STATISTICS

## NON-AGRICULTURAL COMMODITIES

### PRECIOUS METALS

Gold & Silver

### BASE METALS

Aluminium, Copper, Lead,  
Nickel & Zinc

### ENERGY COMMODITIES

Crude Oil & Natural Gas

Intentionally kept blank

# PRECIOUS METALS



## PRECIOUS METALS

Precious metals, particularly gold and silver, need no introduction and have been well sought after metals to possess since ancient times. Investing in precious metals such as gold and silver, also known as bullion, has widely been practiced historically in India as well as in other countries. Precious metals are also used as coins and currencies. Central banks even now hold large quantities of gold as part of their reserves all over the world.

In India, apart from investment purposes, gold and silver have cultural, auspicious and sentimental values attached to them. Hence, most of the Indian households buy physical form of gold and silver as symbols of prosperity. They never like to part with gold and silver under normal circumstances and pass on to next generations. As a result, India has been one of the largest consuming countries of gold and silver. Since domestic production of these metals has been negligible compared to the demand for consumption, India has been largely depending on imports to meet the domestic demand and became one of the major importing countries in the world.

Among all, gold is the most sought after precious metal globally, since ancient times owing to its rarity, easy minting, smelting and fabrication, resistance to corrosion (nobility) and distinctive colour. Gold is used as asset, coins & currency and jewellery. It is also known to have been used in medicines in the recorded history. The world gold standard, fixing of world's major currencies to gold at a set price per ounce, was abandoned in 1976 after following for about 100 years. Jewellery accounts for nearly half of total gold demand, followed by private investment and official purposes such as reserves.

Major mine producing countries of gold in the world include China, Australia, Russia, United States, Peru and South Africa. India and China account for over 50% of global gold demand for gold in the recent years according to the latest report by the WGC. There has been a distinct geographic shift in gold demand from western countries to eastern countries during the last two decades or so.

Silver is the second most important and widely traded precious metal. Similar to gold, silver is also utilized in a number of applications ranging from coins, ornaments, silverware to industrial applications and pharmaceuticals. Silver fabrication accounts for about 55% of total silver utilization in the world followed by jewellery, coins & bars and silverware accounting for 20%, 20% and 5% respectively. Major countries in silver mine production include Mexico, Peru, China, Chile and Russia. India is now one of the top three importing countries in the world.

Gold and silver, apart from trading in widespread physical markets, are also traded extensively in derivatives markets all over the world and in India in order to hedge against price risk. Prices fixed by the London Bullion Market Association (LBMA) are widely used benchmark references for gold and silver globally. Comex is the major international benchmark for derivatives trading in gold and silver. Futures contracts of gold, silver and diamond are available for trading on Indian commodity exchanges. Further, first ever options contracts in India were launched for gold in October 2017 and for silver in May 2018. Further expanding the product base, options in goods with physical commodity as the underlying were introduced in Bullion by three major domestic exchanges including BSE, MCX and NSE during June-July 2020. The first bullion index futures contracts in India were successfully launched on MCX Bulldex on August 24, 2020.



# GOLD

## FUNDAMENTALS

<b>GOLD FUNDAMENTALS (TONNES)</b>					
	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
<b>Global Supply</b>					
Mine production	3290	3399	3447	3509	3464
Net producer hedging	13	38	-26	-12	8
Recycled gold	1121	1282	1156	1176	1304
Total supply	4424	4718	4577	4673	4776
<b>Global Demand</b>					
Jewellery	2459	2101	2237	2240	2107
Technology	332	323	333	335	327
Electronics	262	256	266	268	263
Other Industrial use	51	50	51	51	50
Dentistry	19	18	16	15	14
Investment	968	1647	1252	1170	1272
Total bar and coin demand	1091	1072	1046	1094	871
Physical Bar demand	790	797	782	778	580
Official Coin	224	207	188	242	224
Medals/Imitation Coin	76	68	76	73	67
ETFs & similar products	-122	575	206	76	401
Central banks & other inst.	580	395	379	656	650
Gold demand	4338	4466	4200	4401	4356
<b>Indian Scenario</b>					
Total Supply	1003	641	976	853	777
Net bullion imports	914	551	879	756	647
Scrap	80	80	88	87	120
Domestic other sources#	9	10	9	11	11
Demand	857	666	771	760	690
Bar and coins	195	162	169	162	146
Jewellery demand	662	505	602	598	545

# local mine production, recovery from imported copper concentrates and disinvestment  
Source: World Gold Council, GFMS, US Geological Survey



# GOLD

## FUNDAMENTALS

GOLD FUNDAMENTALS (TONNES)					
	2015	2016	2017	2018	2019*
<b>Major producing countries (mine production)</b>					
China	450	453	426	401	420
Australia	278	290	301	315	330
Russia	252	253	270	311	310
United States	214	222	237	226	200
South Africa	145	145	137	117	90
Canada	153	165	164	183	180
<b>World</b>	<b>3100</b>	<b>3110</b>	<b>3230</b>	<b>3300</b>	<b>3300</b>
<b>Major Consuming Countries</b>					
China	996	929	972	994	848
India	857	666	771	760	690
United States	191	210	159	154	151
Germany	126	121	117	107	107
Turkey	72	70	94	74	87
<b>World</b>	<b>3549</b>	<b>3173</b>	<b>3283</b>	<b>3334</b>	<b>2978</b>
<b>Jewellery demand from major countries</b>					
China	767	645	665	686	637
India	662	505	602	598	545
United States	119	119	124	128	131
Saudi Arabia	70	49	46	39	36
Iran	37	41	45	29	31
<b>World</b>	<b>2459</b>	<b>2101</b>	<b>2237</b>	<b>2240</b>	<b>2107</b>
<b>Reserves (gold) of central government</b>					
United States	8133	8133	8133	8133	8133
Germany	3381	3378	3372	3367	3366
Italy	2452	2452	2452	2452	2452
France	2436	2436	2436	2436	2436
China	1762	1843	1843	1927	1948
India	558	558	558	618	633
<b>World</b>	<b>32749</b>	<b>33293</b>	<b>33735</b>	<b>32640</b>	<b>32833</b>

Source: World Gold Council, USGS Mineral Commodity Surveys; \*Estimated



# GOLD

## FUNDAMENTALS

### MAJOR IMPORT SOURCES AND EXPORT DESTINATIONS OF GOLD# (USD BILLION)

2015		2016		2017		2018		2019	
Country	Value	Country	Value	Country	Value	Country	Value	Country	Value
<b>Major Importing Countries</b>									
China	79.0	Switzerland	82.9	Switzerland	69.8	Switzerland	63.3	United Kingdom	70.8
Switzerland	70.7	China	64.0	India	36.2	India	31.8	Switzerland	60.6
Hong Kong SAR	36.2	United Kingdom	58.0	United Kingdom	34.5	United Arab Emirates	27.7	India	31.2
India	35.0	UAE	32.2	China, Hong Kong SAR	29.4	United Kingdom	25.6	China, Hong Kong SAR	14.0
UAE	25.5	Hong Kong SAR	29.5	Turkey	16.6	China, Hong Kong SAR	23.6	Turkey	11.3

### Major Exporting Countries

Switzerland	72.4	Switzerland	82.3	Switzerland	67.9	Switzerland	64.0	Switzerland	61.9
Hong Kong SAR	45.0	Hong Kong SAR	54.1	China, Hong Kong SAR	52.2	China, Hong Kong SAR	37.2	China, Hong Kong SAR	25.2
United Kingdom	38.5	USA	17.7	USA	19.8	United Kingdom	31.8	United Kingdom	23.3
USA	19.3	UAE	16.5	United Kingdom	17.0	USA	20.3	USA	17.2
UAE	16.3	United Kingdom	15.7	Canada	13.2	United Arab Emirates	15.7	Australia	16.2

### Major Importing Sources for India (USD million)

Switzerland	17013.9	Switzerland	15371.6	Switzerland	17162.2	Switzerland	15221.4	Switzerland	14,466.94
UAE	3329.0	UAE	3256.6	UAE	3535.7	Ghana	3018.0	UAE	2,706.52
Ghana	2782.5	Ghana	1759.0	Ghana	2392.3	UAE	2508.2	Peru	1,423.66
USA	2267.9	USA	1422.7	USA	2099.9	Peru	2207.4	South Africa	1,367.01
South Africa	1591.1	Peru	585.4	Peru	1775.3	USA	2126.7	USA	1,365.26

### Major Exporting Destinations of India (USD million)

UAE	4950.08	UAE	5397.45	UAE	1499.9	Singapore	20.5	Switzerland	55.86
Switzerland	34.55	USA	0.01	Turkey	0.04	Guinea	0.18	South Africa	18.63
Hong Kong	0.08	-	-	-	-	UK	0.04	UAE	6.22
Australia	-	-	-	-	-	Germany	0.03	Hong Kong	0.01
Ghana	-	-	-	-	-	UAE	0.01	UK	0

# includes gold unwrought, semi-manufactured, powder form (HS Code 7108)

Source: UN Comtrade Database, Export-Import databank of India



# GOLD

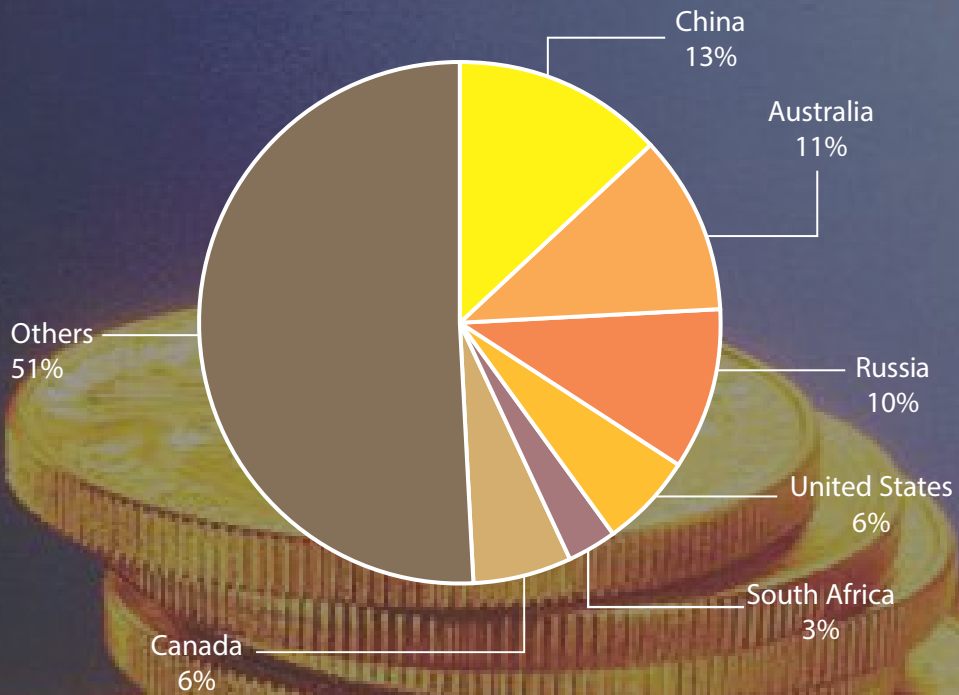
## FUNDAMENTALS

GLOBAL ECONOMIC PARAMETERS IMPACTING PRICES (%)					
	2015	2016	2017	2018	2019
<b>Real GDP Growth</b>					
China	7.0	6.8	6.9	6.8	6.1
Euro area	2.1	1.9	2.5	1.9	1.3
India (fiscal year)	8.0	8.3	7.0	6.1	5.0
Japan	1.2	0.5	2.2	0.3	0.7
United Kingdom	2.4	1.9	1.9	1.3	1.4
United States	2.9	1.6	2.2	2.9	2.3
<b>Consumer Price Inflation</b>					
China	1.4	2.0	1.6	2.1	2.9
Euro area	0.0	0.2	1.4	1.7	1.4
India (fiscal year)	4.9	4.5	3.6	3.4	4.8
Japan	0.8	-0.1	0.5	1.0	0.5
United Kingdom	0.4	1.0	2.6	2.3	1.7
United States	0.1	1.3	2.1	2.4	1.8
<b>Industrial Output Growth</b>					
China	5.9	6.0	5.9	5.8	5.7
Euro area	2.5	2.7	3.1	2.0	-0.2
India (fiscal year)	9.6	7.7	6.3	4.9	1.8
Japan	0.4	0.6	1.6	1.1	-0.4
United Kingdom	1.9	2.0	3.2	0.2	-0.2
United States	3.1	-1.0	-2.0	2.3	3.9
<b>Interest Rates (end of period)</b>					
China	4.35	4.35	4.35	4.35	4.35
India (repo rate)	6.75	6.25	6.25	6.50	5.15
Japan (basic loan/discount rate)	0.00	-0.10	-0.10	-0.10	-0.10
United Kingdom	0.50	0.25	0.50	0.75	0.75
United States	0.50	0.75	1.50	2.25	1.50
<b>Equity Index (end of year)</b>					
US (Dow Jones)	17425	19763	24719	23327	28538
India (BSE-Sensex)	26118	26626	34057	36068	41254

*Source: Data releases of World Bank, Statistical departments of respective countries, BSE, NYSE*

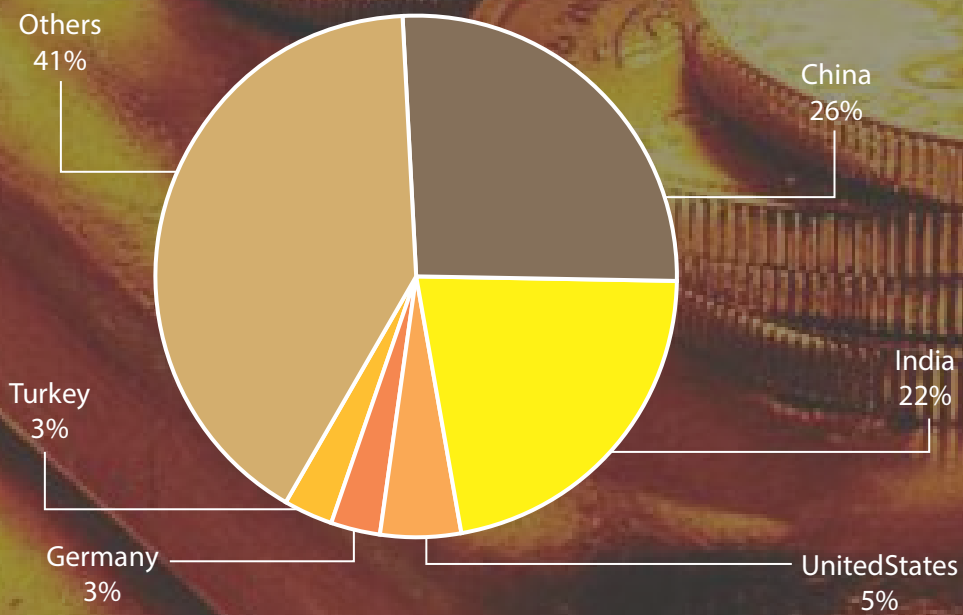


### Gold Mine Production 2019



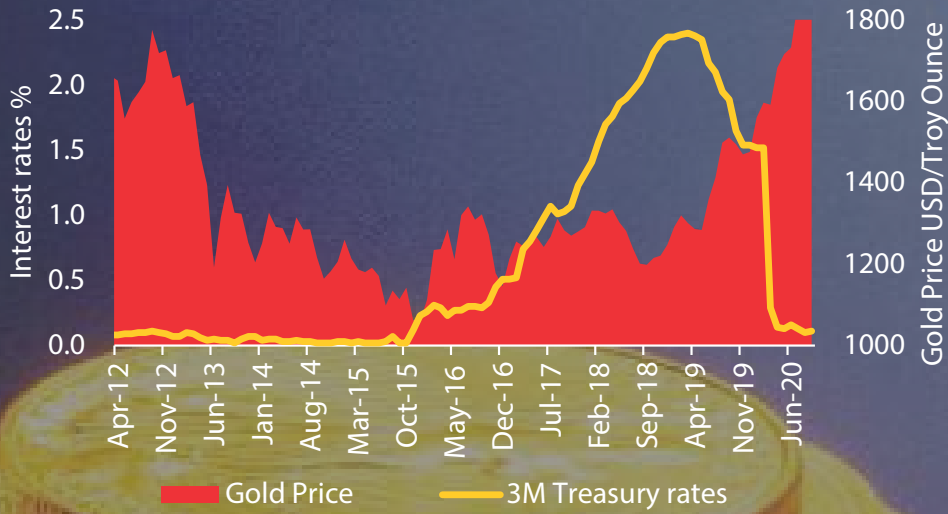
Source: USGS Mineral Commodity Summaries

### Gold Consumption 2019



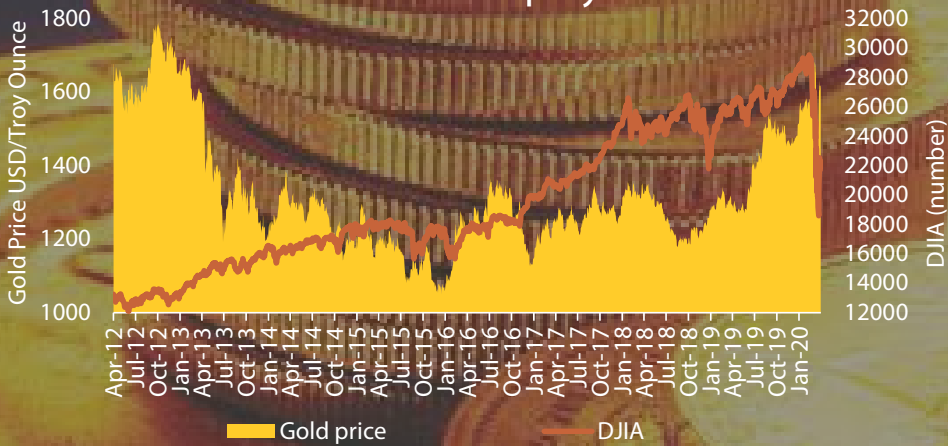
Source: World Gold Council (WGC)

### Gold Prices and US Interest Rates



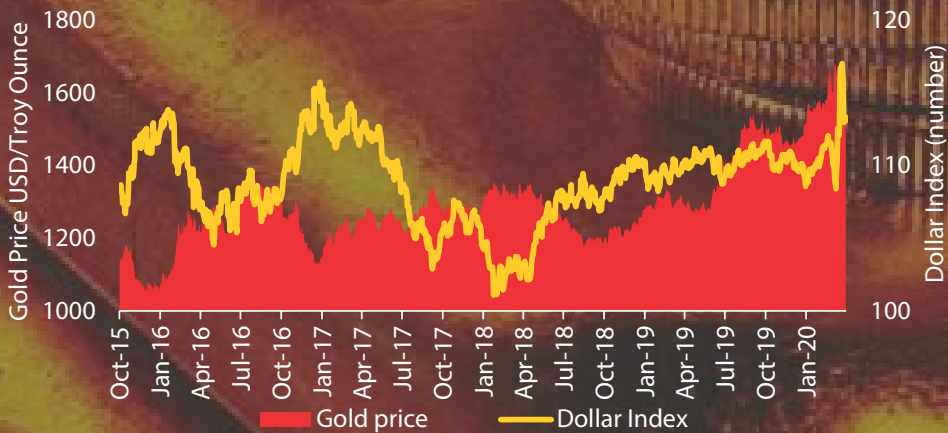
Source: WGC and Federal Reserve Bank of St Louis

### Gold Prices and Equity Trends



Source: WGC and S & P Dow Jones Indices

### Gold Prices and Dollar Index



Source: WGC and Federal Reserve Bank of St. Louis

# SILVER

## FUNDAMENTALS

<b>SILVER FUNDAMENTALS (TONNES)</b>					
<b>World Scenario</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
<b>Global Supply</b>	32713	31907	32116	31237	31821
Mine Production	27798	27789	27276	26616	26019
Recycling	5178	5114	5216	5217	5284
Net Hedging Supply	244	-603	58	-86	487
<b>Global Demand</b>	<b>33186</b>	<b>30964</b>	<b>30004</b>	<b>30738</b>	<b>30848</b>
Coins & Bars	9655	6653	4858	5153	5788
Industrial Demand	14189	15251	16088	15911	15891
of which Photovoltaic	1684	2915	3166	2877	3069
Photography	1282	1174	1092	1062	1047
Jewelry	6301	5884	6104	6316	6262
Silverware	1760	1627	1796	2034	1860
Net Physical Investment	9,655	6,653	4,858	5,153	5,788
Market Balance	-137	1,936	2,099	886	973
Change in ETP Holdings	-534	1584	211	-694	2540
<b>Indian Scenario</b>					
Total Supply	8051	3335	5748	7740	6328
Mine Production	374	436	526	658	633
Recycling of Scrap	97	106	112	124	129
Imports	7579	2793	5110	6958	5566
Silver Fabrication:	7374	5081	5327	6864	3466
Coins And Medals Including The Use Of Scrap	225	222	259	328	353
Industrial Applications	1116	1122	1166	1256	1181
Electrical And Electronics	451	453	435	451	-
Brazing Alloys And Solders	66	67	69	71	68
Jewelry And Silverware	2911	2738	3231	3698	3430
Jewelry	1760	1677	1995	2256	2148
Silverware	1151	1061	1236	1442	1282

Source: World Silver Survey 2020



# SILVER

## FUNDAMENTALS

<b>SILVER FUNDAMENTALS (TONNES)</b>					
	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
<b>Major Producing Countries (mine production)</b>					
Mexico	5975	5796	6055	6116	5919
Peru	4291	4625	4587	4508	4210
China	3503	3569	3502	3574	3443
Russia	1588	1450	1305	1350	1320
Chile	1504	1501	1319	1311	1189
Bolivia	1306	1353	1243	1240	1158
World	27798	27789	27276	26616	26019
<b>Major countries with Industrial demand</b>					
China	3117	3265	3650	3774	3773
United States	3180	3682	3818	3885	3756
Japan	2814	3255	3381	2911	2911
Germany	900	906	935	969	963
South Korea	590	561	593	595	571
World	14189	15251	16088	15911	15891

*Source: World Silver Survey 2020*





# SILVER

## FUNDAMENTALS

### MAJOR IMPORT SOURCES AND EXPORT DESTINATIONS OF SILVER# (USD BILLION)

2015		2016		2017		2018		2019	
Country	Value	Country	Value	Country	Value	Country	Value	Country	Value
<b>Major Importing Countries</b>									
India	4.26	USA	4.38	USA	3.65	India	3.85	USA	3.21
USA	3.87	United Kingdom	2.44	India	2.99	USA	3.34	India	2.94
United Kingdom	2.12	India	1.82	United Kingdom	2.83	United Kingdom	2.03	United Kingdom	2.06
Canada	1.04	Canada	1.26	Japan	1.17	Japan	1.13	China, Hong Kong SAR	1.04
Germany	0.87	Japan	1.04	China, Hong Kong SAR	0.91	China, Hong Kong SAR	0.92	Japan	0.93

### Major Exporting Countries

United Kingdom	1.92	Mexico	1.89	China, Hong Kong SAR	3.12	China, Hong Kong SAR	2.19	Mexico	1.84
Mexico	1.89	Rep. of Korea	1.67	Mexico	1.98	Mexico	1.77	China, Hong Kong SAR	1.57
Canada	1.5	Canada	1.64	Germany	1.48	UK	1.45	Germany	1.29
Rep. of Korea	1.39	China, Hong Kong SAR	1.52	Japan	1.44	USA	1.31	Rep. of Korea	1.28
Germany	1.3	Japan	1.44	Rep. of Korea	1.37	Rep. of Korea	1.28	Japan	1.20

### Major Importing Sources for India (USD million)

2015-16		2016-17		2017-18		2018-19		2019-20	
UK	1152	Hong Kong	479	Hong Kong	1395	UK	1064	Hong Kong	901.92
Switzerland	486	China P RP	441	UK	554	Hong Kong	970	UK	488.96
China P RP	385	Korea Rp	192	Russia	400	Russia	325	USA	195.19
Russia	347	Russia	172	China P RP	326	China P RP	322	Russia	181.04
Korea RP	266	UK	112	Singapore	88	USA	302	Switzerland	174.56

### Major Exporting Destinations of India (USD million)

USA	2.9	USA	4.9	USA	3.9	USA	4.3	USA	3.3
UAE	1.7	UAE	3.1	UAE	2.0	UAE	2.9	UAE	2.0
Mexico	0.4	Mexico	0.5	Canada	0.6	Iran	1.1	Germany	1.0
Canada	0.4	Canada	0.4	Germany	0.5	Germany	0.9	Canada	0.5
UK	0.2	Philippines	0.3	Iran	0.4	Canada	0.6	Iran	0.5

# includes Silver, unwrought or semi-manufactured, silver powder (HS Code - 7106)

Source: UN Comtrade Database, Export-Import databank of India



# SILVER

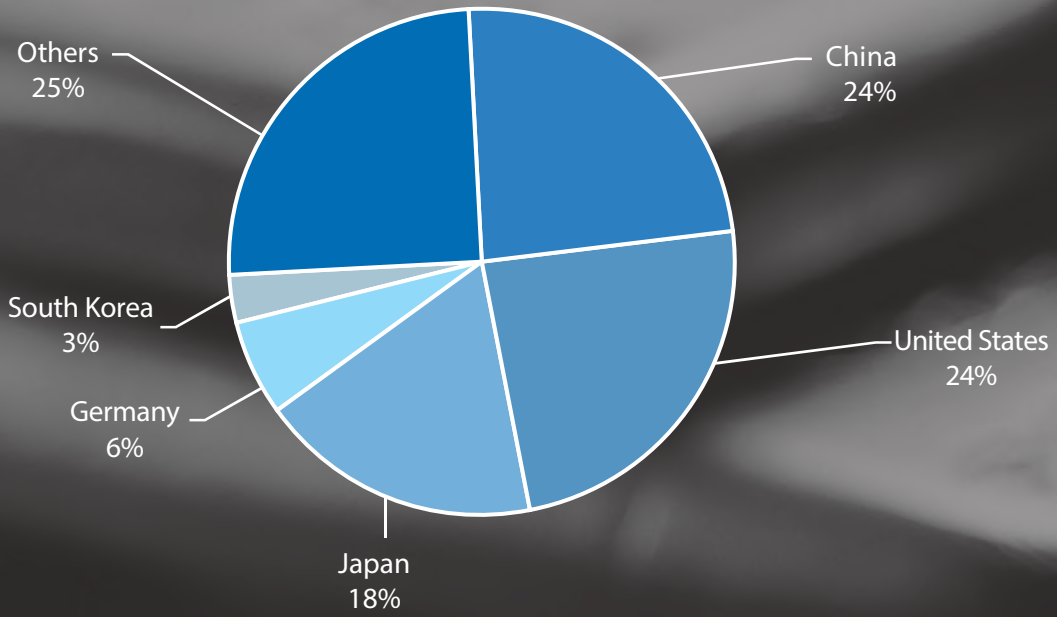
## FUNDAMENTALS

GLOBAL ECONOMIC PARAMETERS IMPACTING PRICES (%)					
	2015	2016	2017	2018	2019
<b>Real GDP Growth</b>					
China	7.0	6.8	6.9	6.8	6.1
Euro area	2.1	1.9	2.5	1.9	1.3
India (fiscal year)	8.0	8.3	7.0	6.1	5.0
Japan	1.2	0.5	2.2	0.3	0.7
United Kingdom	2.4	1.9	1.9	1.3	1.4
United States	2.9	1.6	2.2	2.9	2.3
<b>Consumer Price Inflation</b>					
China	1.4	2.0	1.6	2.1	2.9
Euro area	0.0	0.2	1.4	1.7	1.4
India (fiscal year)	4.9	4.5	3.6	3.4	4.8
Japan	0.8	-0.1	0.5	1.0	0.5
United Kingdom	0.4	1.0	2.6	2.3	1.7
United States	0.1	1.3	2.1	2.4	1.8
<b>Industrial Output Growth</b>					
China	5.9	6.0	5.9	5.8	5.7
Euro area	2.5	2.7	3.1	2.0	-0.2
India (fiscal year)	9.6	7.7	6.3	4.9	1.8
Japan	0.4	0.6	1.6	1.1	-0.4
United Kingdom	1.9	2.0	3.2	0.2	-0.2
United States	3.1	-1.0	-2.0	2.3	3.9
<b>Interest Rates (end of period)</b>					
China	4.35	4.35	4.35	4.35	4.35
India (repo rate)	6.75	6.25	6.25	6.50	5.15
Japan (basic loan/discount rate)	0.00	-0.10	-0.10	-0.10	-0.10
United Kingdom	0.50	0.25	0.50	0.75	0.75
United States	0.50	0.75	1.50	2.25	1.50
<b>Equity Index (end of year)</b>					
US (Dow Jones)	17425	19763	24719	23327	28538
India (BSE-Sensex)	26118	26626	34057	36068	41254

*Source: Data releases of World Bank, Statistical departments of respective countries, BSE, NYSE*

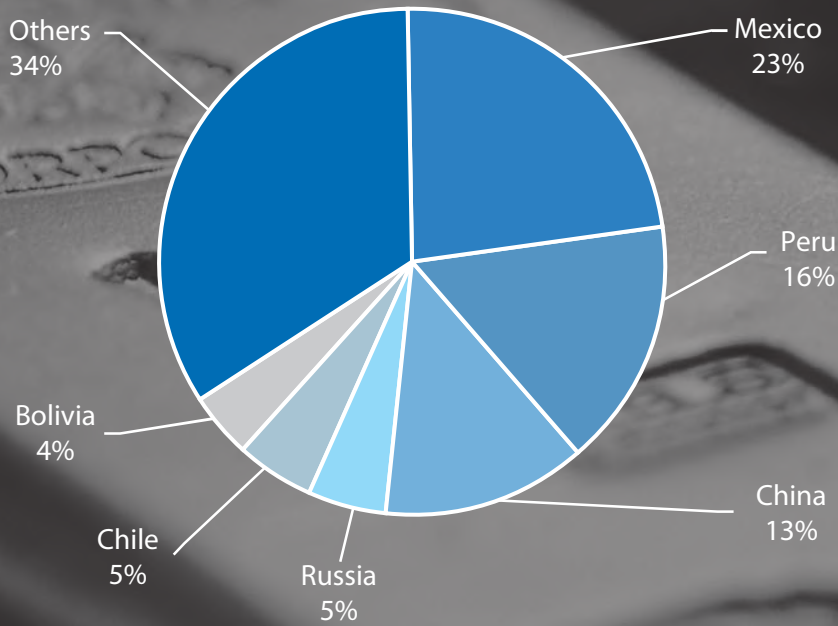


### Silver Industrial Demand 2019



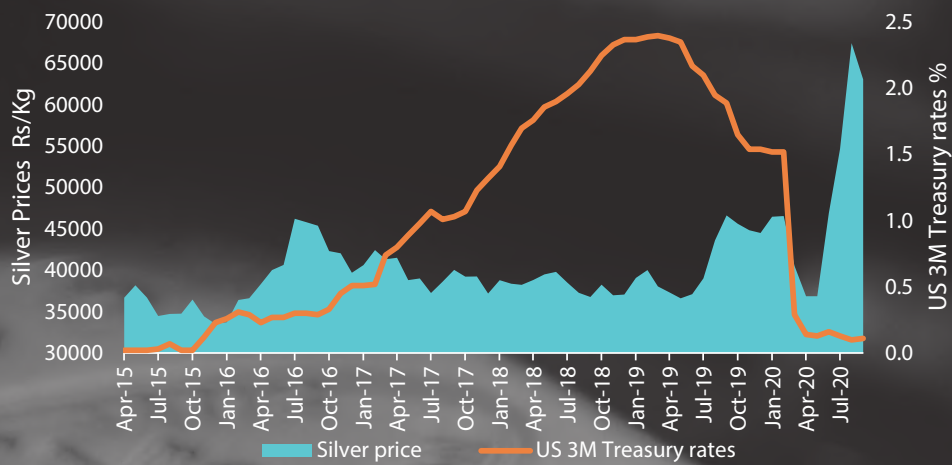
Source: World Silver Survey 2018

### Silver Mine Production 2019



Source: World Silver Survey 2018

### Trends in Silver Prices vs US 3M Treasury rates



Source: MCX and Fed Res. St Luis

# BASE METALS



## BASE METALS

Base metals are common, less expensive industrial non-ferrous metals. Metals and metal alloys possess high structural strength per unit of mass, which makes them useful for carrying large loads or resisting impact damage. Metal alloys can be engineered to have high resistance to shear, torque and deformation. Strength and resilience have led to their frequent use in high-rise building & bridge construction, vehicles, tools, pipes, non-illuminated signs, railroad tracks and numerous other appliances.

Although there are numerous base metals, most widely used and traded are aluminium, copper, zinc, lead, nickel and tin. China and USA are major producers and consumers of majority of the base metals. China alone accounts for about half of global base metals consumption. While China is self-reliant in zinc and aluminium, it relies heavily on imports in case of copper. India is net importer of almost all the base metals to meet domestic consumption demand.

Aluminium is the most widely used non-ferrous metal and is the third most common metal on earth. It is used in industries like transportation, packaging, cookware, construction, electrical applications, electronic appliances etc., China alone accounts for more than 50% of world's production as well as consumption of aluminium. Russia, Canada, India and Australia are other important producers of aluminium.

Copper is one of the metals used since ancient times. It is a good conductor of heat & electricity, corrosion resistant and antimicrobial. It is widely used in industrial applications as power cables, telecommunication cables, railways, cathodes etc. Copper is majorly produced in Chile, Peru, China and Australia. India is net importer of copper.

Zinc and lead minerals are known to coexist in varying concentrations in the earth's crust. Zinc is the fourth most common metal in use, after iron, aluminium, and copper. Zinc is largely used for galvanizing iron to protect against corrosion. Zinc is also used to produce die castings, which are used extensively by the automotive, electrical, and hardware industries. Lead, on the other hand, is toxic metal with high density. It is extensively used in acid batteries and also used as protection against radiation. Lead being toxic metal requires special measures in its recycling and waste management and is regulated by pollution control boards and ministry of environment. China is the largest producer and consumer of zinc and lead. Other important producers are Korea, India, Canada and Japan.

Nickel is known to be the fifth most common element in the earth's crust, most of which is inaccessible. It is widely used in the manufacturing of stainless and other alloys that are corrosion resistant. Alloy of nickel and copper are extensively used in pipes in desalination plants. China is the largest producer and consumer of nickel in the world. India completely depends on imports to meet all domestic consumption requirements.

Prices of base metals, apart from demand and supply, are largely influenced by a number of factors such as indicators of housing and auto sector performance in major countries, mining activity related policy & regulatory developments in the major producing countries, inventory levels etc. London Metal Exchange (LME) prices are widely acknowledged benchmark reference prices for base metals all over the world and India. In India, futures contracts in metals are available for aluminium, copper, zinc, lead, nickel and brass, an alloy of copper and zinc. Further, options contracts on copper and zinc futures are also available from May 2018. During 2019, all base metal futures contracts traded on domestic exchanges have become compulsory delivery contracts. Following the permission from SEBI, index based futures contracts on MCX MetIdx were launched on October 19, 2020.

# ALUMINIUM

## FUNDAMENTALS

ALUMINIUM FUNDAMENTALS					
World Scenario ('000 tonnes)	2015	2016	2017	2018	2019
Primary Aluminium Production	58456	59890	63404	64336	63697
Production capacity	71200	75500	77800	77000	77900
Primary Aluminium Consumption	57722	60922	68700	60524	62270

Source: USGS, World Aluminium (International Aluminium Institute), WBMS; \*Estimated

Indian Scenario	2015-16	2016-17	2017-18	2018-19	2019-20
Production	1815	1746	1843	3694	3656
Imports	1671	1751	1958	2318	2152
Exports	1153	1547	2012	2338	2371

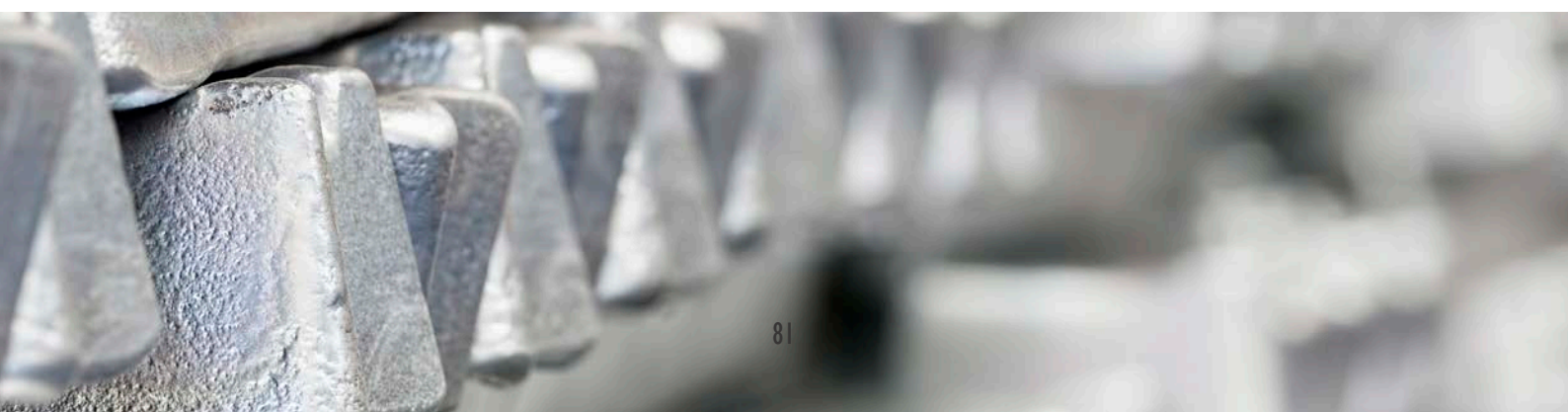
Sources: Indian Bureau of Mines, Ministry of Commerce & Industry, Gol

MAJOR PRODUCERS OF PRIMARY ALUMINUM (000 TONNES)					
	2015	2016	2017	2018	2019
World	57890	58900	59400	63600	64000
China	31400	31900	32300	35800	36000
Russia	3530	3560	2600	3630	3600
Canada	2880	3210	3210	2920	2900
India	2355	2720	3270	3680	3700
UAE	2400	2500	2600	2640	2700

Source: USGS Mineral Commodity Summaries; \*Estimated

MAJOR IMPORTING AND EXPORTING COUNTRIES					
	2015	2016	2017	2018	2019
<b>Major Importing Countries (USD billion)</b>					
USA	17.9	18.7	23.4	24.2	22.3
Germany	15.8	14.9	18.7	19.9	17.5
Japan	8.0	6.9	8.3	9.3	8.0
France	6.5	6.3	6.9	7.5	7.2
China	6.9	5.9	6.6	9.1	0.9
Total	154.8	128.7	154.9	177.0	159.8
<b>Major Exporting Countries (USD billion)</b>					
China	23.8	21.2	22.6	6.9	0.6
Germany	15.2	14.6	16.4	17.8	16.6
USA	12.0	12.2	11.6	12.6	10.9
Canada	8.2	8.1	9.8	10.0	8.3
Russian Federation	7.1	6.0	6.7	6.3	5.8
Total	158.6	137.6	150.9	159.9	135.1

Source: UN Comtrade Database (HS code 76)

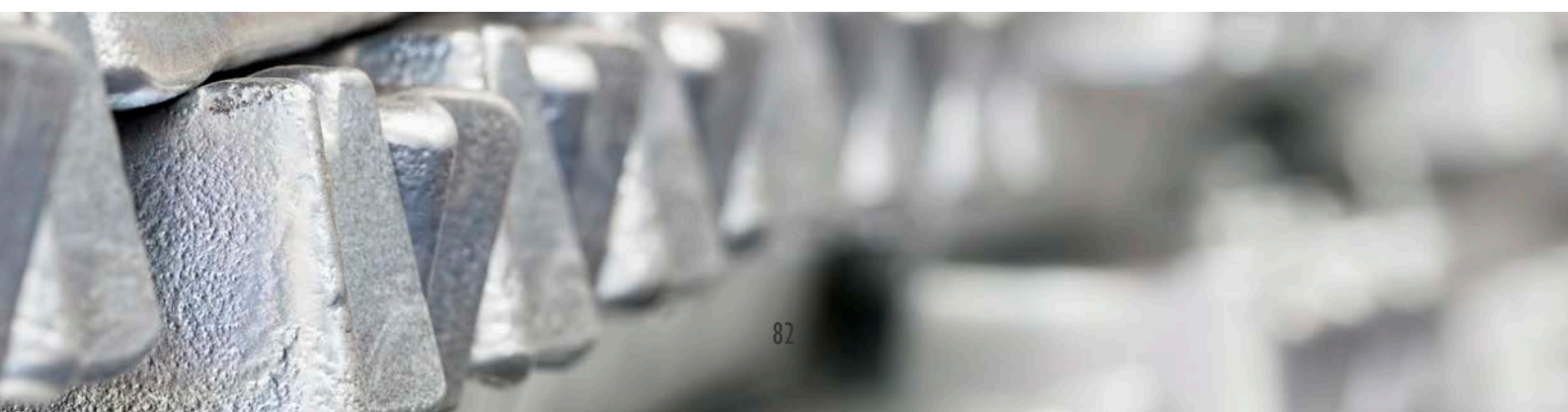


# ALUMINIUM

## FUNDAMENTALS

MAJOR IMPORT SOURCES AND EXPORT DESTINATIONS FOR INDIA (VALUE IN ₹ LAKH)									
2015-16		2016-17		2017-18		2018-19		2019-20	
Country	Value	Country	Value	Country	Value	Country	Value	Country	Value
<b>Imports Sources (HS code 76)</b>									
China P Rp	445373	China P Rp	443900	China P Rp	486724	China P Rp	824469	China P Rp	675919
UAE	235790	UAE	236775	UAE	257929	UAE	321908	Malaysia	257768
UK	139584	Malaysia	172921	Malaysia	257258	Malaysia	338881	UAE	204995
Malaysia	133028	UK	164351	UK	225441	UK	239174	UK	184375
Saudi Arab	119341	Saudi Arab	136060	Saudi Arab	190530	Saudi Arab	181058	USA	364701
Total	2241930	Total	2332595	Total	2915466	Total	3816626	Total	3109455
<b>Exports destinations (HS code 76)</b>									
Korea Rp	354125	Korea Rp	497888	Malaysia	499803	Malaysia	643985	Malaysia	905728
USA	192839	USA	234609	Korea Rp	492737	Korea Rp	366779	Korea Rp	652530
Mexico	132716	Malaysia	180283	USA	438677	USA	547956	USA	451083
Malaysia	122672	Mexico	110017	Turkey	164259	Turkey	324902	Taiwan	99672
UAE	60973	Italy	108546	Italy	127193	Italy	176105	Japan	96383
Total	1711954	Total	2161505	Total	3078767	Total	3987562	Total	3610345

Source: Export-Import Data Bank, Ministry of Commerce, Govt



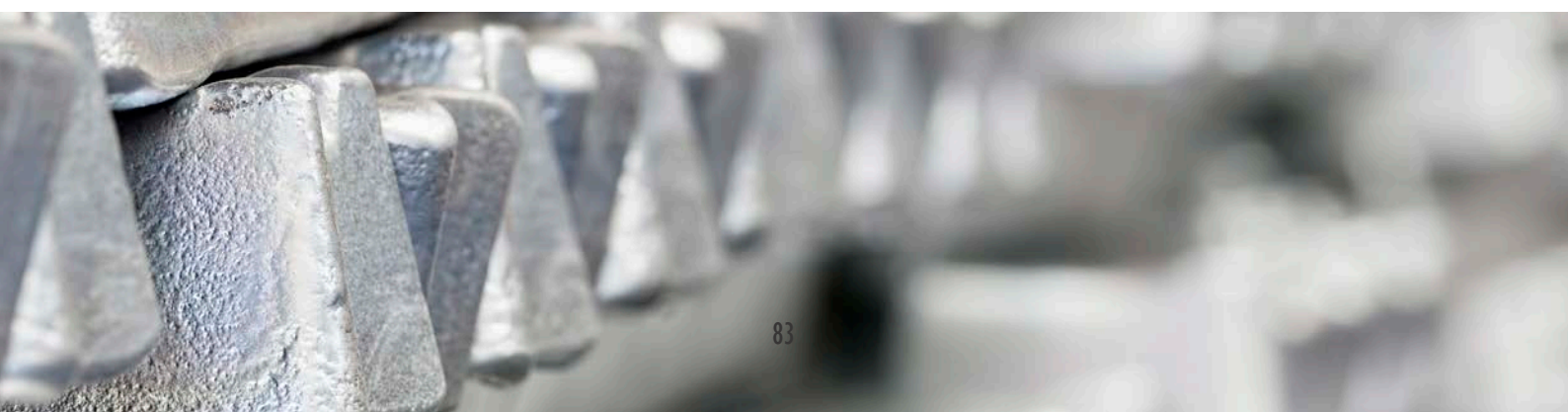


# ALUMINIUM

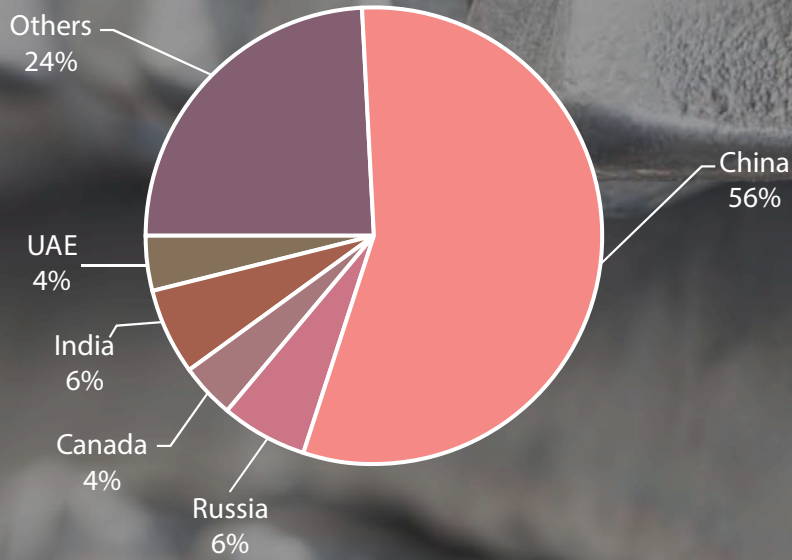
## FUNDAMENTALS

GLOBAL ECONOMIC PARAMETERS IMPACTING PRICES (%)					
	2015	2016	2017	2018	2019
<b>Real GDP Growth</b>					
China	7.0	6.8	6.9	6.8	6.1
Euro area	2.1	1.9	2.5	1.9	1.3
India (fiscal year)	8.0	8.3	7.0	6.1	5.0
Japan	1.2	0.5	2.2	0.3	0.7
United Kingdom	2.4	1.9	1.9	1.3	1.4
United States	2.9	1.6	2.2	2.9	2.3
<b>Consumer Price Inflation</b>					
China	1.4	2.0	1.6	2.1	2.9
Euro area	0.0	0.2	1.4	1.7	1.4
India (fiscal year)	4.9	4.5	3.6	3.4	4.8
Japan	0.8	-0.1	0.5	1.0	0.5
United Kingdom	0.4	1.0	2.6	2.3	1.7
United States	0.1	1.3	2.1	2.4	1.8
<b>Industrial Output Growth</b>					
China	5.9	6.0	5.9	5.8	5.7
Euro area	2.5	2.7	3.1	2.0	-0.2
India (fiscal year)	9.6	7.7	6.3	4.9	1.8
Japan	0.4	0.6	1.6	1.1	-0.4
United Kingdom	1.9	2.0	3.2	0.2	-0.2
United States	3.1	-1.0	-2.0	2.3	3.9
<b>Interest Rates (end of period)</b>					
China	4.35	4.35	4.35	4.35	4.35
India (repo rate)	6.75	6.25	6.25	6.50	5.15
Japan (basic loan/discount rate)	0.00	-0.10	-0.10	-0.10	-0.10
United Kingdom	0.50	0.25	0.50	0.75	0.75
United States	0.50	0.75	1.50	2.25	1.50
<b>Equity Index (end of year)</b>					
US (Dow Jones)	17425	19763	24719	23327	28538
India (BSE-Sensex)	26118	26626	34057	36068	41254

*Source: Data releases of World Bank, Statistical departments of respective countries, BSE, NYSE*

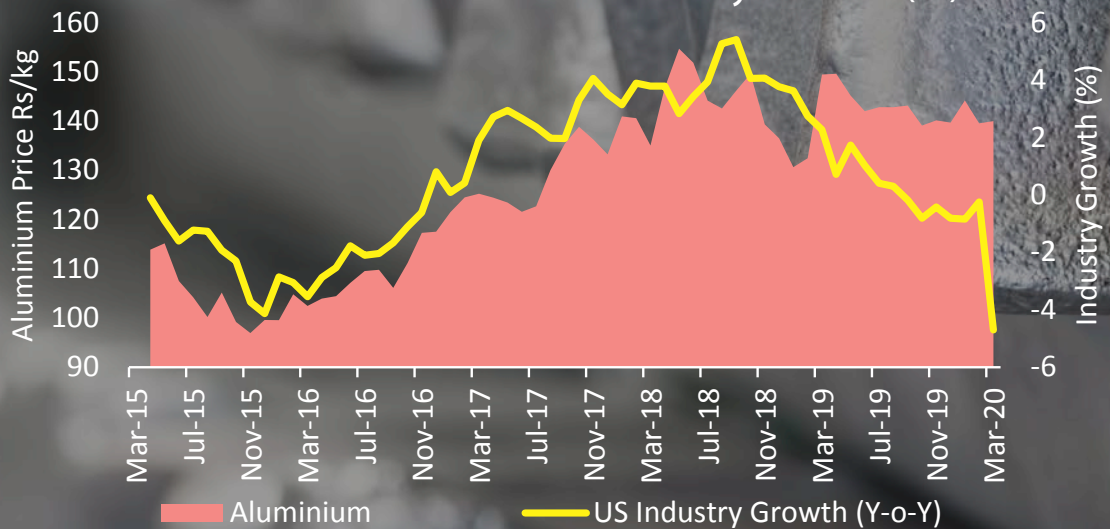


### Aluminium Production 2019



Source: USGS Mineral Commodity Summaries

### Aluminium Prices and US Industry Growth (%)



Source: MCX and Federal Reserve Bank of St. Louis

# COPPER

## FUNDAMENTALS

<b>COPPER FUNDAMENTALS (000 TONNES)</b>					
<b>Particular</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
<b>World Scenario</b>					
Mine Production	19149	20386	20097	20557	20531
Mine Capacity	22367	23481	23993	24082	24134
Capacity Utilization (%)	86	87	84	85	85
Primary Refined Production	18892	19490	19495	20061	19988
Secondary Refined Production	3946	3866	4053	4043	4051
World Refined Production	22838	23357	23548	24104	24039
World Refinery Capacity	26542	26853	27375	27710	28788
Refineries Capacity Utilization (%)	86	87	86	87	84
World Refined Usage	23081	23512	23732	24511	24455
World Refined Stocks	1505	1365	1375	1227	1228

Source: International Copper Study Group

<b>Particular</b>	<b>2015-16</b>	<b>2016-17</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>
<b>Indian Scenario</b>					
Production	790	796	848	737	408
Import	471	507	553	680	732
Export	416	453	511	135	141

Source: Ministry of Mines; Ministry of Commerce & Industry

<b>Country/ Region</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019*</b>
<b>Major Countries in Mine Production</b>					
Chile	5760	5550	5500	5830	5600
Peru	1700	2350	2450	2440	2400
China	1710	1900	1710	1600	1600
United States	1380	1430	1260	1220	1300
Australia	971	948	860	950	960
World	19100	20100	20000	21000	20000

Sources: USGS Mineral Commodity Summaries; \*Estimated

# COPPER

## FUNDAMENTALS

MAJOR IMPORTING AND EXPORTING COUNTRIES					
Country	2015	2016	2017	2018	2019
<b>Major Importers (USD billion)</b>					
China	38.1	33.3	41.3	12.9	1.5
Germany	9.5	8.6	10.9	12.2	10.5
USA	8.4	7.5	10.1	11.0	9.6
Italy	6.4	5.6	7.1	7.5	6.7
Rep. of Korea	5.5	5.1	5.7	5.8	5.3
<b>Major Exporters (USD billion)</b>					
Chile	17.3	15.1	17.8	18.1	15.2
Germany	10.9	10.2	12.4	13.3	11.6
USA	7.1	6.3	7.4	8.4	7.3
Japan	6.8	6.4	7.2	8.5	7.6
China	5.6	5.8	6.5	1.5	1.7

Source: UN Comtrade Database

MAJOR IMPORT SOURCES AND EXPORT DESTINATIONS FOR INDIA (₹ LAKH)									
2015-16		2016-17		2017-18		2018-19		2019-20	
Country	Value	Country	Value	Country	Value	Country	Value	Country	Value
<b>Imports in the form of Copper and articles thereof (HS code 74)</b>									
UAE	357186	Zambia	447472	Zambia	572723	Zambia	292572	Japan	597507
Zambia	291682	UAE	332247	UAE	355308	UAE	519575	Zambia	511242
Malaysia	231182	Malaysia	255380	Malaysia	351595	Malaysia	420853	UAE	468286
Russia	188886	Vietnam Soc Rep	141149	Vietnam Soc Rep	273920	Vietnam Soc Rep	341436	Malaysia	383755
China P Rp	106856	China P Rp	116773	Japan	154882	Japan	346939	Vietnam Soc Rep	316325
Total	2150766	Total	2270885	Total	2905824	Total	3687262	Total	3610182

<b>Imports in the form of Copper Ores and concentrates (HS code 2603)</b>									
Chile	1054544	Chile	611465	Chile	1121320	Chile	540907	Chile	561274
Indonesia	417336	Indonesia	408341	Indonesia	466638	Indonesia	272587	Peru	87489
Australia	280871	Australia	238010	Peru	341719	Peru	103367	Australia	61708
Canada	200687	Peru	232468	Brazil	244172	Saudi Arabia	42072	Indonesia	49327
Brazil	169303	Brazil	83902	Australia	219451	Australia	202495	Saudi Arabia	31423
Total	2629654	Total	1829870	Total	2783448	Total	1214620	Total	866752

<b>Exports in the form of Copper and articles thereof (HS code 74)</b>									
China P Rp	748899	China P Rp	475039	China P Rp	998370	China P Rp	172555	China P Rp	189360
UAE	170098	UAE	206508	UAE	219200	UAE	35561	USA	110999
Malaysia	150326	Singapore	196648	Malaysia	180523	USA	107230	UAE	32717
USA	93709	Taiwan	193581	Qatar	133798	Qatar	44899	UK	20476
Singapore	89562	Malaysia	190242	Korea Rp	124050	TAIWAN	27208	Saudi Arabia	18553
Total	1617412	Total	1766826	Total	2203405	Total	700303	Total	606005

Source: Export-Import Data Bank, Ministry of Commerce, Govt of India

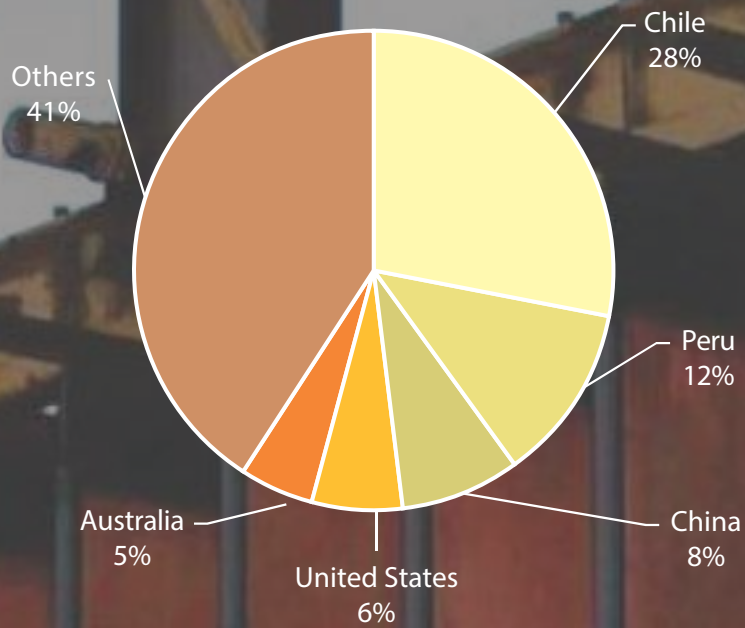
# COPPER

## FUNDAMENTALS

GLOBAL ECONOMIC PARAMETERS IMPACTING PRICES (%)					
	2015	2016	2017	2018	2019
<b>Real GDP Growth</b>					
China	7.0	6.8	6.9	6.8	6.1
Euro area	2.1	1.9	2.5	1.9	1.3
India (fiscal year)	8.0	8.3	7.0	6.1	5.0
Japan	1.2	0.5	2.2	0.3	0.7
United Kingdom	2.4	1.9	1.9	1.3	1.4
United States	2.9	1.6	2.2	2.9	2.3
<b>Consumer Price Inflation</b>					
China	1.4	2.0	1.6	2.1	2.9
Euro area	0.0	0.2	1.4	1.7	1.4
India (fiscal year)	4.9	4.5	3.6	3.4	4.8
Japan	0.8	-0.1	0.5	1.0	0.5
United Kingdom	0.4	1.0	2.6	2.3	1.7
United States	0.1	1.3	2.1	2.4	1.8
<b>Industrial Output Growth</b>					
China	5.9	6.0	5.9	5.8	5.7
Euro area	2.5	2.7	3.1	2.0	-0.2
India (fiscal year)	9.6	7.7	6.3	4.9	1.8
Japan	0.4	0.6	1.6	1.1	-0.4
United Kingdom	1.9	2.0	3.2	0.2	-0.2
United States	3.1	-1.0	-2.0	2.3	3.9
<b>Interest Rates (end of period)</b>					
China	4.35	4.35	4.35	4.35	4.35
India (repo rate)	6.75	6.25	6.25	6.50	5.15
Japan (basic loan/discount rate)	0.00	-0.10	-0.10	-0.10	-0.10
United Kingdom	0.50	0.25	0.50	0.75	0.75
United States	0.50	0.75	1.50	2.25	1.50
<b>Equity Index (end of year)</b>					
US (Dow Jones)	17425	19763	24719	23327	28538
India (BSE-Sensex)	26118	26626	34057	36068	41254

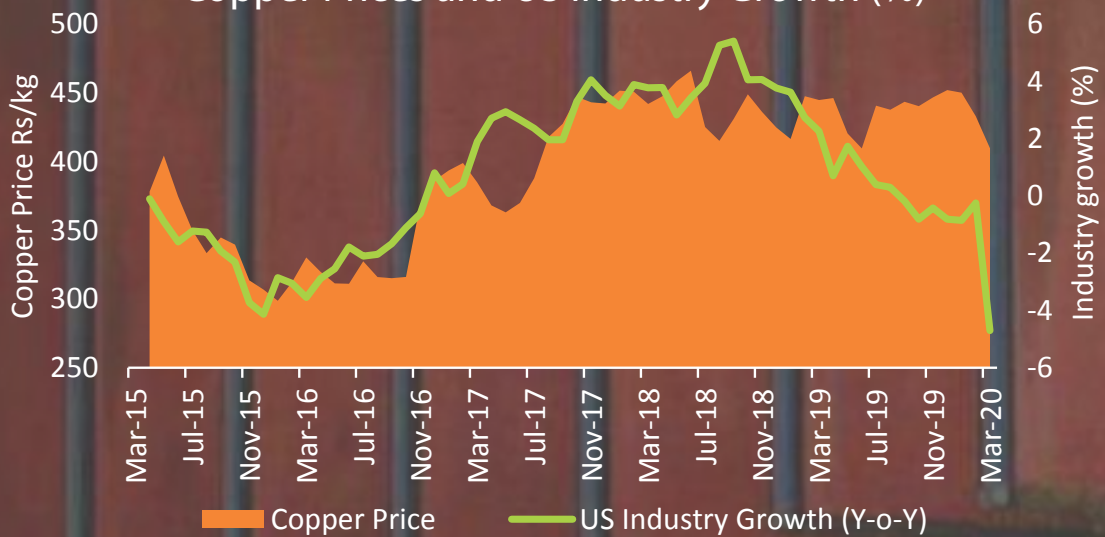
*Source: Data releases of World Bank, Statistical departments of respective countries, BSE, NYSE*

### Copper Mine Production 2019



Source: USGS Mineral Commodity Summaries

### Copper Prices and US Industry Growth (%)



Source: MCX and Federal Reserve Bank of St. Louis

# LEAD

## FUNDAMENTALS

LEAD FUNDAMENTALS ('000 TONNES)					
World Scenario	2015	2016	2017	2018	2019
Mine production	4850	4689	4713	4625	4650
Smelter production	10959	11169	11589	11837	11942
Consumption	10941	11141	11740	11915	11913

Source: International Lead and Zinc Study Group, USGS

Indian Scenario	2015-16	2016-17	2017-18	2018-19	2019-20
Production	145	139	168	198	181
Import	269	307	352	360	349
Export	89	181	160	177	175

Source: Indian Bureau of Mines, Ministry of Commerce & Industry, Gol

	2015	2016	2017	2018	2019*
<b>Major Countries in Mine Production</b>					
China	2400	2340	2150	2100	2100
Australia	500	453	459	450	430
US	335	346	310	260	280
Peru	310	314	307	300	290
Mexico	250	232	243	240	240

Source: USGS Mineral Commodity Summaries; \*Estimated

# LEAD

## FUNDAMENTALS

MAJOR IMPORTING AND EXPORTING COUNTRIES					
	2015	2016	2017	2018	2019
<b>Major Importers (USD million)</b>					
USA	1053	1116	1558	1347	1081
India	500	564	744	860	664
United Kingdom	514	411	584	465	457
Germany	328	343	554	595	521
Czech Republic	374	314	407	415	353
Total	6448	6726	7822	8021	7001
<b>Major Exporters (USD million)</b>					
Australia	809	874	951	812	576
Rep. of Korea	522	778	848	878	775
Canada	542	560	637	607	553
United Kingdom	514	522	618	598	520
Germany	431	358	510	512	387
Total	6405	6711	7966	8047	6547

Source: UN Comtrade Database

MAJOR IMPORT SOURCES AND EXPORT DESTINATIONS FOR INDIA (RS. LAKH)									
2015-16		2016-17		2017-18		2018-19		2019-20	
Country	Value	Country	Value	Country	Value	Country	Value	Country	Value
Korea Rp	68707	Korea Rp	91839	Korea Rp	105845	Korea Rp	128815	Korea Rp	109140
Australia	63015	Australia	63806	Australia	77803	Australia	77644	Malaysia	46734
UAE	31348	UAE	41680	Vietnam Soc Rep	46834	USA	42200	USA	42466
UK	19002	Vietnam Soc Rep	27923	UAE	43105	UAE	46327	UK	42324
USA	18137	UK	25252	Malaysia	38265	UK	42795	UAE	38845
Total	321445	Total	400656	Total	525037	Total	547549	Total	499234

Imports in the form of Lead Ores and Concentrates (HS Code 2607)									
Turkey	912	Turkey	2102	UAE	344	UAE	411	UAE	567
UAE	671	UAE	440	Saudi Arabia	215	Tanzania Republic	139	Mozambique	417
Qatar	341	South Africa	125	Turkey	197	Nigeria	74	Morocco	237
Saudi Arab	241	Morocco	108	Yemen Republic	149	Canada	77	South Africa	103
Yemen Republic	167	Yemen Republic	102	Sudan	140	Morocco	69	Nigeria	82
Total	2647	Total	3187	Total	1494	Total	855	Total	1667

Exports in the form of Lead and articles thereof (HS code 78)									
Korea Rp	31906	U S A	69248	Korea Rp	71195	Korea Rp	110801	Korea Rp	79406
U S A	23287	Korea Rp	26888	U S A	68563	Thailand	28485	Vietnam	43107
Vietnam Soc Rep	14507	Taiwan	16681	Bangladesh Pr	21679	Turkey	17607	Thailand	38215
UAE	5897	UAE	14180	Vietnam Soc Rep	19576	Vietnam Soc Rep	34251	UAE	17984
Taiwan	5844	Vietnam Soc Rep	6615	Taiwan	15716	UAE	15304	Bangladesh	17374
Total	118831	Total	159479	Total	255722	Total	281998	Total	264225

Source: Export-Import Data Bank, Ministry of Commerce, Govt



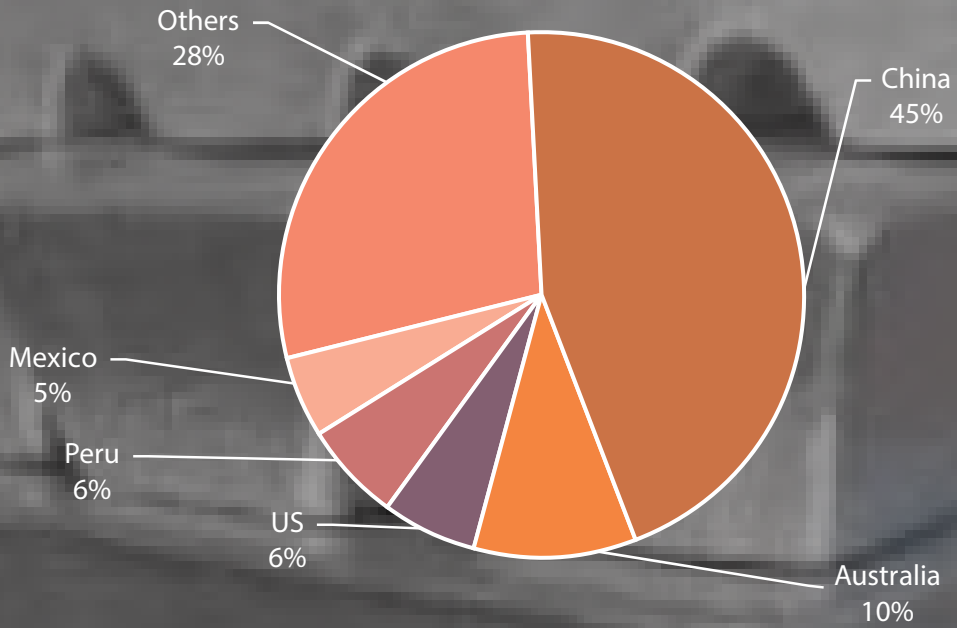
# LEAD

## FUNDAMENTALS

GLOBAL ECONOMIC PARAMETERS IMPACTING PRICES (%)					
	2015	2016	2017	2018	2019
<b>Real GDP Growth</b>					
China	7.0	6.8	6.9	6.8	6.1
Euro area	2.1	1.9	2.5	1.9	1.3
India (fiscal year)	8.0	8.3	7.0	6.1	5.0
Japan	1.2	0.5	2.2	0.3	0.7
United Kingdom	2.4	1.9	1.9	1.3	1.4
United States	2.9	1.6	2.2	2.9	2.3
<b>Consumer Price Inflation</b>					
China	1.4	2.0	1.6	2.1	2.9
Euro area	0.0	0.2	1.4	1.7	1.4
India (fiscal year)	4.9	4.5	3.6	3.4	4.8
Japan	0.8	-0.1	0.5	1.0	0.5
United Kingdom	0.4	1.0	2.6	2.3	1.7
United States	0.1	1.3	2.1	2.4	1.8
<b>Industrial Output Growth</b>					
China	5.9	6.0	5.9	5.8	5.7
Euro area	2.5	2.7	3.1	2.0	-0.2
India (fiscal year)	9.6	7.7	6.3	4.9	1.8
Japan	0.4	0.6	1.6	1.1	-0.4
United Kingdom	1.9	2.0	3.2	0.2	-0.2
United States	3.1	-1.0	-2.0	2.3	3.9
<b>Interest Rates (end of period)</b>					
China	4.35	4.35	4.35	4.35	4.35
India (repo rate)	6.75	6.25	6.25	6.50	5.15
Japan (basic loan/discount rate)	0.00	-0.10	-0.10	-0.10	-0.10
United Kingdom	0.50	0.25	0.50	0.75	0.75
United States	0.50	0.75	1.50	2.25	1.50
<b>Equity Index (end of year)</b>					
US (Dow Jones)	17425	19763	24719	23327	28538
India (BSE-Sensex)	26118	26626	34057	36068	41254

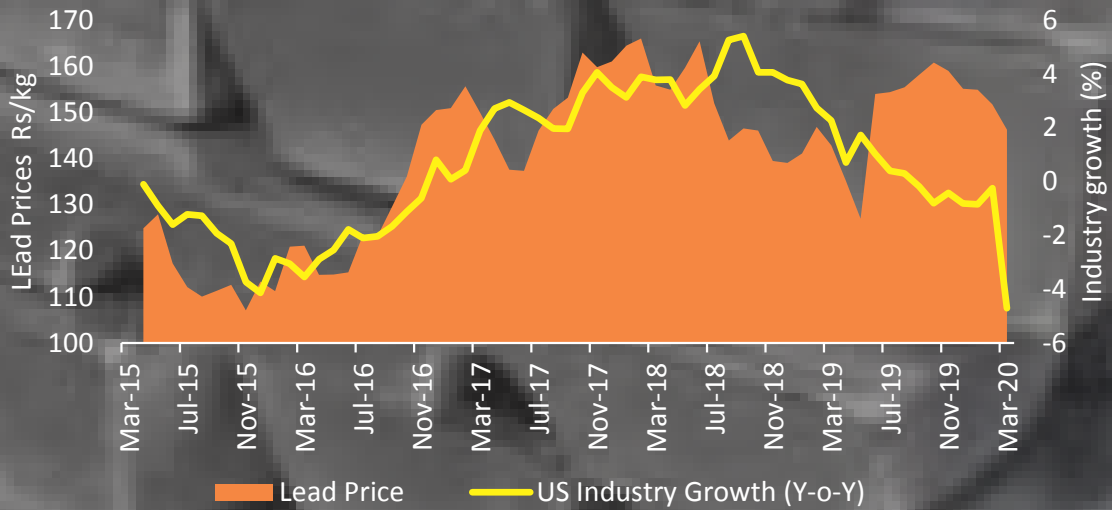
*Source: Data releases of World Bank, Statistical departments of respective countries, BSE, NYSE*

### Lead Mine Production 2019



Source: USGS Mineral Commodity Summaries

### Lead Prices and US Industry Growth (%)



Source: MCX and Federal Reserve Bank of St. Louis

# NICKEL

## FUNDAMENTALS

### NICKEL FUNDAMENTALS (000 TONNES)

World Scenario	2015	2016	2017	2018	2019*
Mine Production	2280	2090	2160	2400	2700
Refined Production	1967	1989	2076	2182	2380
Refined consumption	1882	2033	2192	2328	2464

Sources: USGS Mineral Commodity Summaries; International Nickel Study Group

Indian Scenario	2015-16	2016-17	2017-18	2018-19	2019-20
Production	0	0	0	0	0
Import	133	122	157	154	173
Export	8	1	1	1	1

Sources: Indian Bureau of Mines, Ministry of Commerce & Industry, Gol

### Major countries in Mine Production

World	2280	2090	2160	2400	2700
Indonesia	130	199	345	606	800
Philippines	554	347	366	345	420
New Caledonia	186	207	215	216	220
Canada	235	236	214	176	180
Australia	222	204	179	170	180

Sources: USGS Mineral Commodity Summaries; \*Estimated

# NICKEL

## FUNDAMENTALS

### MAJOR IMPORT SOURCES AND EXPORT DESTINATIONS IN THE WORLD (VALUE IN USD MILLION)

2015		2016		2017		2018		2019	
Country	Value	Country	Value	Country	Value	Country	Value	Country	Value
China	5155	China	4957	China	4643	USA	2952	USA	2929
USA	2629	USA	1973	USA	2420	Japan	2892	Japan	2769
Japan	2302	Japan	1746	Japan	2050	Germany	1900	Germany	1867
Malaysia	1886	Germany	1149	Germany	1454	Norway	1839	Norway	1744
Germany	1374	UK	1005	Norway	1255	UK	1513	United Kingdom	1521
Total	26595	Total	19436	Total	20942	Total	22478	Total	22442
<b>Major Exporters</b>									
Canada	4127	Canada	3111	Canada	2841	Canada	3160	USA	3119
Russia	2665	Russia	2019	Russia	2058	Russia	2605	Canada	2981
USA	2187	USA	1881	USA	2006	USA	2759	Russian Federation	2975
Singapore	1422	UK	1083	UK	1209	Malaysia	1422	Germany	1571
Malaysia	1422	Germany	958	Germany	1202	Germany	1502	United Kingdom	1401
Total	24759	Total	16404	Total	17534	Total	22374	Total	22726

Source: UN Comtrade Database (Nickel and articles thereof)

2015-16		2016-17		2017-18		2018-19		2019-20	
<b>Major Import Sources and Export Destinations for India (Value in Rs. lakh)</b>									
<b>Imports in the form of Nickel and articles thereof (HS code 75)</b>									
Singapore	133626	Russia	46998	Australia	75284	Norway	55312	Japan	66600
Australia	64715	Norway	42043	Norway	57670	South Africa	47111	Norway	60319
Russia	45683	Australia	39850	Russia	39585	Netherlands	43434	China P Rp	55974
Malaysia	43760	Canada	33257	South Africa	30426	UK	39342	USA	49642
Canada	41694	South Africa	27681	Canada	28109	USA	34423	South Africa	39725
Total	585615	Total	370808	Total	407789	Total	516808	Total	554943
<b>Exporters in the form of Nickel and articles thereof (HS code 75)</b>									
Malaysia	111052	China P Rp	25239	China P Rp	3560	USA	6361	China P Rp	27315
Singapore	73725	UAE	5301	USA	3411	Korea Rp	5002	UK	4142
Korea Rp	61065	Malaysia	5158	UK	2396	Saudi Arabia	4888	USA	3895
UAE	33566	Korea Rp	4814	Singapore	2260	UK	4553	Saudi Arab	3400
China P Rp	23191	Taiwan	4388	Saudi Arabia	2350	China P Rp	2980	Mexico	2648
Total	320733	Total	61197	Total	27319	Total	46488	Total	65325

Source: Export-Import Data Bank, Ministry of Commerce, Govt

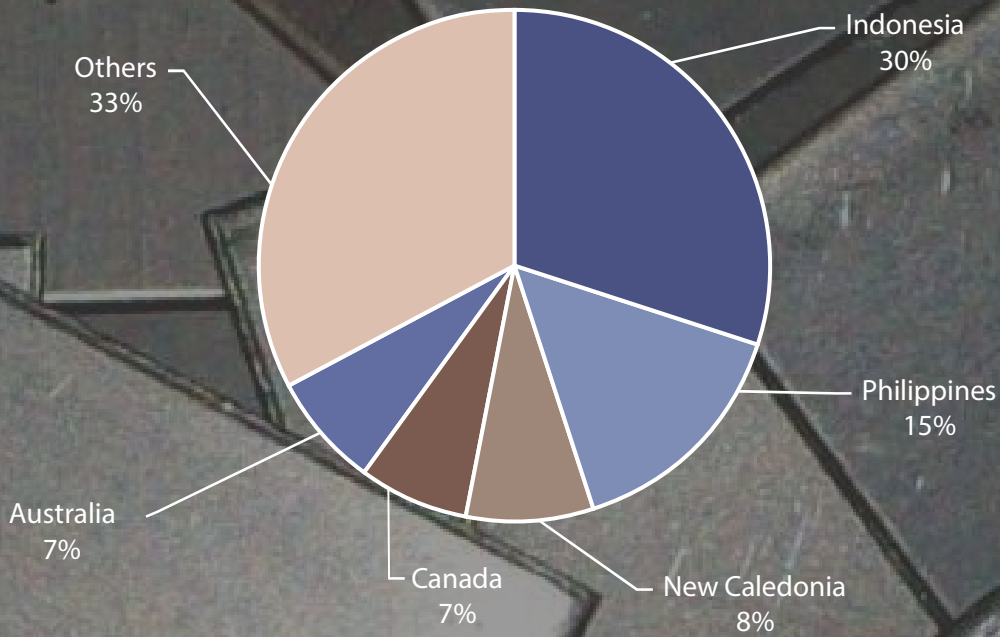
# NICKEL

## FUNDAMENTALS

GLOBAL ECONOMIC PARAMETERS IMPACTING PRICES (%)					
	2015	2016	2017	2018	2019
<b>Real GDP Growth</b>					
China	7.0	6.8	6.9	6.8	6.1
Euro area	2.1	1.9	2.5	1.9	1.3
India (fiscal year)	8.0	8.3	7.0	6.1	5.0
Japan	1.2	0.5	2.2	0.3	0.7
United Kingdom	2.4	1.9	1.9	1.3	1.4
United States	2.9	1.6	2.2	2.9	2.3
<b>Consumer Price Inflation</b>					
China	1.4	2.0	1.6	2.1	2.9
Euro area	0.0	0.2	1.4	1.7	1.4
India (fiscal year)	4.9	4.5	3.6	3.4	4.8
Japan	0.8	-0.1	0.5	1.0	0.5
United Kingdom	0.4	1.0	2.6	2.3	1.7
United States	0.1	1.3	2.1	2.4	1.8
<b>Industrial Output Growth</b>					
China	5.9	6.0	5.9	5.8	5.7
Euro area	2.5	2.7	3.1	2.0	-0.2
India (fiscal year)	9.6	7.7	6.3	4.9	1.8
Japan	0.4	0.6	1.6	1.1	-0.4
United Kingdom	1.9	2.0	3.2	0.2	-0.2
United States	3.1	-1.0	-2.0	2.3	3.9
<b>Interest Rates (end of period)</b>					
China	4.35	4.35	4.35	4.35	4.35
India (repo rate)	6.75	6.25	6.25	6.50	5.15
Japan (basic loan/discount rate)	0.00	-0.10	-0.10	-0.10	-0.10
United Kingdom	0.50	0.25	0.50	0.75	0.75
United States	0.50	0.75	1.50	2.25	1.50
<b>Equity Index (end of year)</b>					
US (Dow Jones)	17425	19763	24719	23327	28538
India (BSE-Sensex)	26118	26626	34057	36068	41254

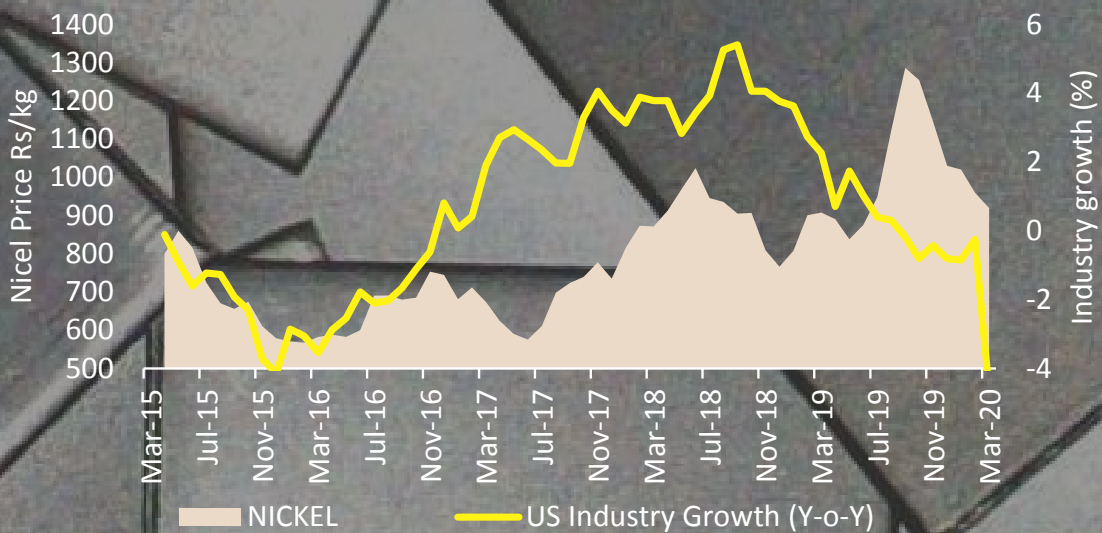
Source: Data releases of World Bank, Statistical departments of respective countries, BSE, NYSE

### Nickel Mine Production 2019



Sources: USGS Mineral Commodity Summaries

### Nickel Prices and US Industry Growth (%)



Source: MCX and Federal Reserve Bank of St. Louis

# ZINC

## FUNDAMENTALS

ZINC FUNDAMENTALS ('000 TONNES)					
	2015	2016	2017	2018	2019
<b>World Scenario</b>					
Mine Production	13626	12604	12527	12785	12893
Metal Production	13812	13579	13222	13102	13494
Consumption	13643	13707	13710	13648	13691

Source: International Lead and Zinc Study Group, USGS

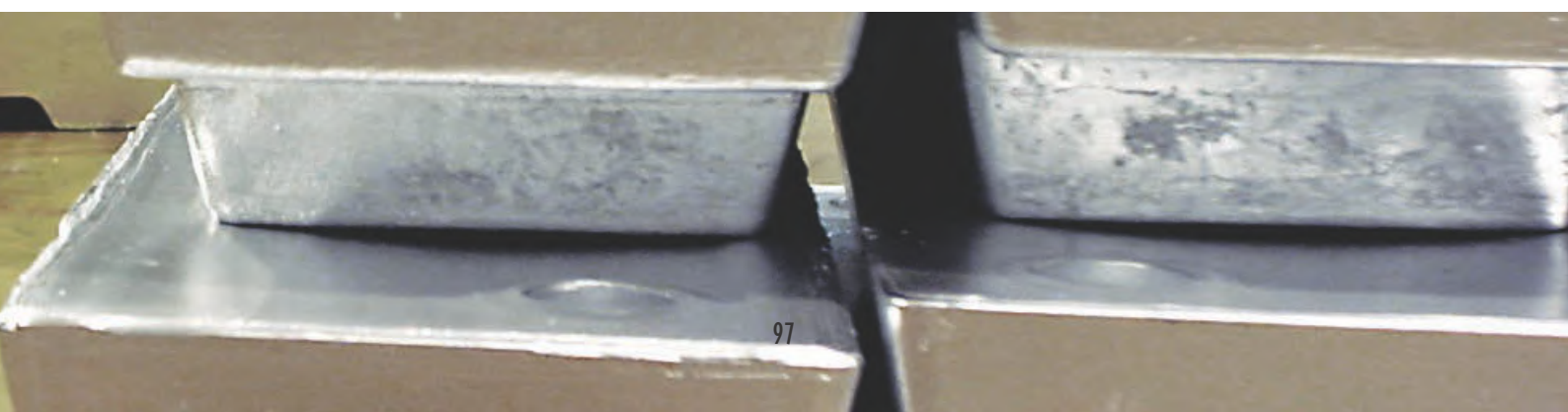
	2015-16	2016-17	2017-18	2018-19	2019-20
<b>Indian Scenario</b>					
Production	759	671	791	696	688
Import	227	310	273	278	250
Export	258	229	287	196	213

Sources: Indian Bureau of Mines, Ministry of Commerce & Industry, Gol

Country	2015	2016	2017	2018	2019*
<b>Major Countries in Mine Production</b>					
World	12800	12600	12500	12500	13000
China	4300	4800	4400	4170	4300
Peru	1420	1330	1470	1470	1400
Australia	1600	965	842	1110	1300
United States	825	805	774	824	780
Mexico	680	670	674	691	690
India	821	682	833	750	800

	2015	2016	2017	2018	2019
<b>Major Refined Zinc Producing Countries</b>					
World	13812	13572	13268	13279	13537
China	6116	6196	5875	5730	6171
Korea	835	899	847	866	865
India	838	628	818	746	712
Canada	683	691	598	686	648
Japan	567	534	524	521	525

Source: USGS Mineral Commodity Summaries; ILZSG; \*Estimated



# ZINC

## FUNDAMENTALS

Country	2014	2015	2016	2017	2018	2019
<b>Major Importing Countries (USD million)</b>						
USA	1822	1778	1820	2234	2599	2416
Germany	1474	1264	1307	1855	1929	1595
China	1639	1445	1171	2497	246	209
Belgium	929	772	852	1175	1084	870
India	522	439	700	721	863	681
Total	15155	13963	11934	17002	16920	14742
<b>Major Exporting Countries (USD million)</b>						
Rep. of Korea	1053	1169	1301	1654	1879	1534
Canada	1163	1168	1203	1401	1847	1567
Belgium	1206	984	1019	1342	1928	1286
Spain	874	835	814	1261	1253	1493
Australia	920	812	804	1283	1268	1013
Total	14800	13786	11595	17505	18918	16398

Source: UN Comtrade Database

### MAJOR IMPORT SOURCES AND EXPORT DESTINATIONS FOR INDIA (RS. LAKH)

2015-16		2016-17		2017-18		2018-19		2019-20	
Country	Value	Country	Value	Country	Value	Country	Value	Country	Value
<b>Imports in the form of Zinc and articles thereof (HS code 79)</b>									
Korea Rp	122620	Korea Rp	225823	Korea Rp	278600	Korea Rp	253652	Korea Rp	218095
UAE	36550	UAE	40164	UAE	51826	UAE	50990	Japan	49079
Australia	20830	Spain	19305	USA	22880	USA	32006	USA	30409
Spain	15037	Malaysia	18692	Australia	20354	Australia	27153	UAE	25461
USA	12118	USA	17870	Netherlands	11082	Japna	24023	Italy	11686

### Imports in the form of Zinc Ores and concentrates (HS code 2608)

USA	75	Turkey	615	Turkey	-	Ethiopia	285	Ethiopia	16.3
Ethiopia	58	Spain	162	Spain	-	UAE	102	UAE	6.1
UAE	54	Japan	29	Japan	-	Nigeria	0.4	UK	4.24
Saudi Arab		USA	23	USA	-	USA	-	China P Rp	0.03
Turkey		Korea Rp	23	Korea Rp	-	Korea Rp	-	USA	0

### Exports in the form of Zinc and articles thereof (HS code 79)

Malaysia	61967	Malaysia	96594	China	186148	Korea Rp	91163	Korea Rp	66701
Korea South	56952	Korea South	62736	Korea South	104413	Taiwan	54310	Taiwan	63817
Singapore	42654	Taiwan	42420	Malaysia	78025	China	38190	China P Rp	58700
Taiwan	37568	China	31469	Taiwan	36554	UAE	36458	Singapore	48074
UAE	20896	UAE	19318	UAE	31016	Nepal	35056	Nepal	31845
Total	343457	Total	410946	Total	616799	Total	418999	Total	403729

Sources: Ministry of Commerce & Industry, Gol



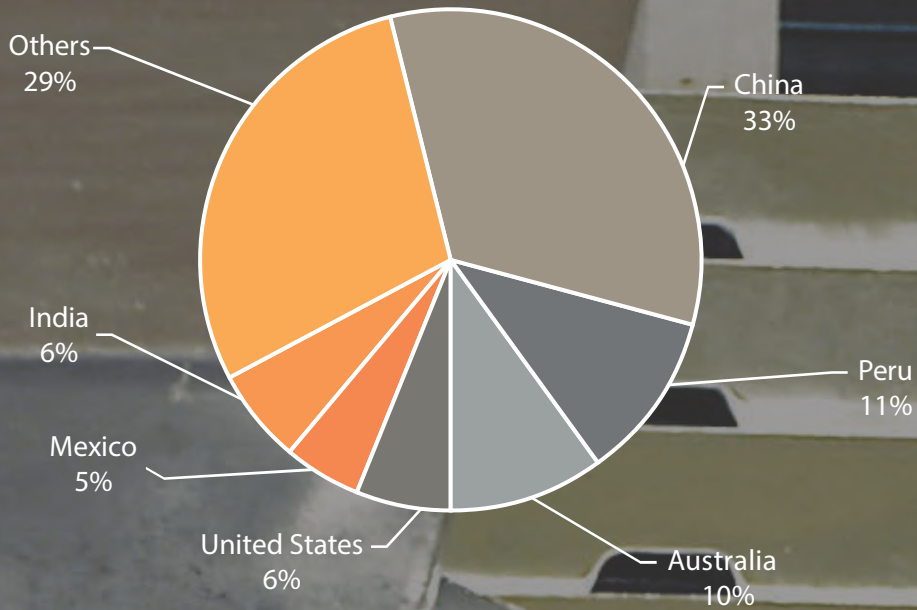
# ZINC

## FUNDAMENTALS

GLOBAL ECONOMIC PARAMETERS IMPACTING PRICES (%)					
	2015	2016	2017	2018	2019
<b>Real GDP Growth</b>					
China	7.0	6.8	6.9	6.8	6.1
Euro area	2.1	1.9	2.5	1.9	1.3
India (fiscal year)	8.0	8.3	7.0	6.1	5.0
Japan	1.2	0.5	2.2	0.3	0.7
United Kingdom	2.4	1.9	1.9	1.3	1.4
United States	2.9	1.6	2.2	2.9	2.3
<b>Consumer Price Inflation</b>					
China	1.4	2.0	1.6	2.1	2.9
Euro area	0.0	0.2	1.4	1.7	1.4
India (fiscal year)	4.9	4.5	3.6	3.4	4.8
Japan	0.8	-0.1	0.5	1.0	0.5
United Kingdom	0.4	1.0	2.6	2.3	1.7
United States	0.1	1.3	2.1	2.4	1.8
<b>Industrial Output Growth</b>					
China	5.9	6.0	5.9	5.8	5.7
Euro area	2.5	2.7	3.1	2.0	-0.2
India (fiscal year)	9.6	7.7	6.3	4.9	1.8
Japan	0.4	0.6	1.6	1.1	-0.4
United Kingdom	1.9	2.0	3.2	0.2	-0.2
United States	3.1	-1.0	-2.0	2.3	3.9
<b>Interest Rates (end of period)</b>					
China	4.35	4.35	4.35	4.35	4.35
India (repo rate)	6.75	6.25	6.25	6.50	5.15
Japan (basic loan/discount rate)	0.00	-0.10	-0.10	-0.10	-0.10
United Kingdom	0.50	0.25	0.50	0.75	0.75
United States	0.50	0.75	1.50	2.25	1.50
<b>Equity Index (end of year)</b>					
US (Dow Jones)	17425	19763	24719	23327	28538
India (BSE-Sensex)	26118	26626	34057	36068	41254

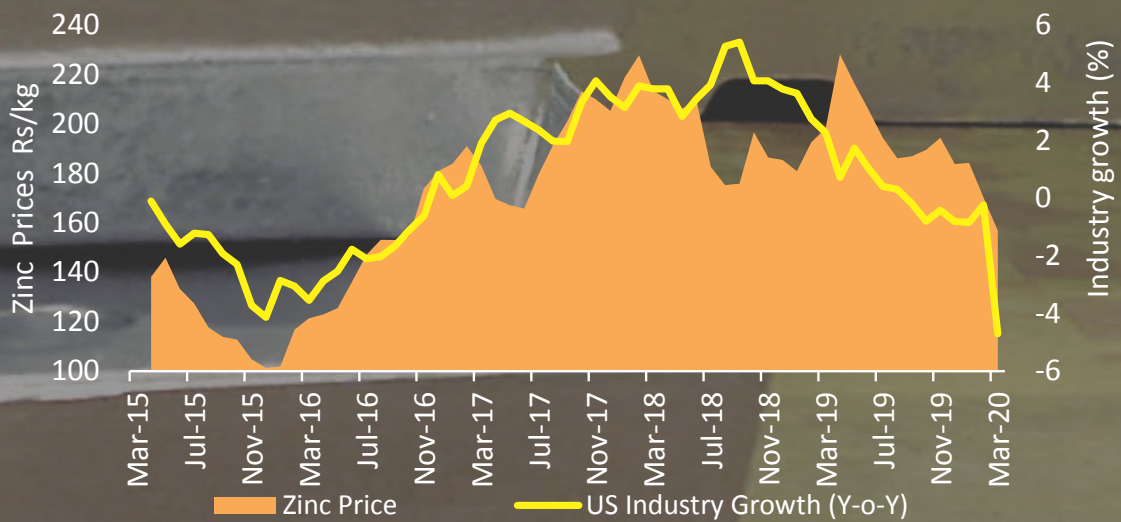
*Source: Data releases of World Bank, Statistical departments of respective countries, BSE, NYSE*

### Zinc Mine Production 2019



Source: USGS Mineral Commodity Summaries

### Zinc Prices and US Industry Growth (%)



Source: Websites of LME and Federal Reserve Bank of St. Louis

# ENERGY COMMODITIES



## ENERGY COMMODITIES

Energy products, generated from either renewable or non-renewable sources, have become an essential part of our life to carry out any activity from simple cooking to run businesses, manufacturing, transportation etc. Major non-renewable energy sources include coal, crude oil, natural gas and nuclear fuel. At present, crude oil provides for nearly 40% of world energy requirements, primarily in the form of fueling automobiles for transportation.

Crude oil is the most widely used non-renewable energy in the production of a number of fuel and non-fuel products such as fuel oils like petrol or gasoline, LPG, paraffin wax, tar, petroleum coke, petro-chemicals etc., The petroleum industry generally classifies crude oil based on its geographic location of production (West Texas Intermediate, Brent, or Oman), its Sulphur content and density in terms of American Petroleum Institute (API) gravity as referred by the petroleum industry.

Crude oil is the most traded energy commodity in the world as its production is concentrated in few countries while it is utilized extensively all over the world. Major producing countries include US, Saudi Arabia, Russia, Iran and Iraq. India relies heavily on import of crude oil to meet its steadily growing domestic consumption demand.

Natural gas is the cleanest source of energy generated from fossil fuels containing mostly methane, emits greenhouse gases to an extent of 40% of that emitted by coal and 25% of that emitted by petroleum oil. Hence, as a less polluting alternative fuel energy source, it is replacing petroleum oil in transportation sector in the form of compressed natural gas across the world. It is widely used for electricity generation, cooking, heating, running automobiles and major feedstock for fertilizers. Natural gas production is largely concentrated in US, Russia, Iran, Qatar and Canada. India's domestic consumption demand for natural gas is met through domestic production to an extent of about 60% and the rest of it is met from imports in the form of liquefied natural gas (LNG) largely from Qatar.

Prices of energy products, particularly crude oil and natural gas, have been highly sensitive to geo-political tensions owing to their wide spread demand and limited sources of supply. In order to hedge against the price volatilities, futures contracts in crude oil and natural gas are available for trading in India. Crude oil and natural gas futures on New York Mercantile Exchange (NYMEX) are considered as global benchmarks. In India, futures contracts in crude oil and natural gas are offered on domestic commodity derivatives exchanges to hedge against the price risk arising from adverse price movements. Further, options contracts on crude oil futures are also made available on domestic exchanges from May 2018.

Crude oil prices are largely influenced by the expectations on the demand from major consuming countries, decisions related to production announced by the Organization of the Petroleum Exporting Countries (OPEC), crude oil production and inventory position in US, economic growth conditions in major consuming countries, crude oil inventories in OPEC and non-OPEC countries, weather conditions in major producing and consuming countries, supply of shale etc. In addition, geopolitical tensions that may disrupt production and supply influences crude oil prices. In India, prices of petroleum products are now slowly becoming market determined as the government is withdrawing control in a phased manner.

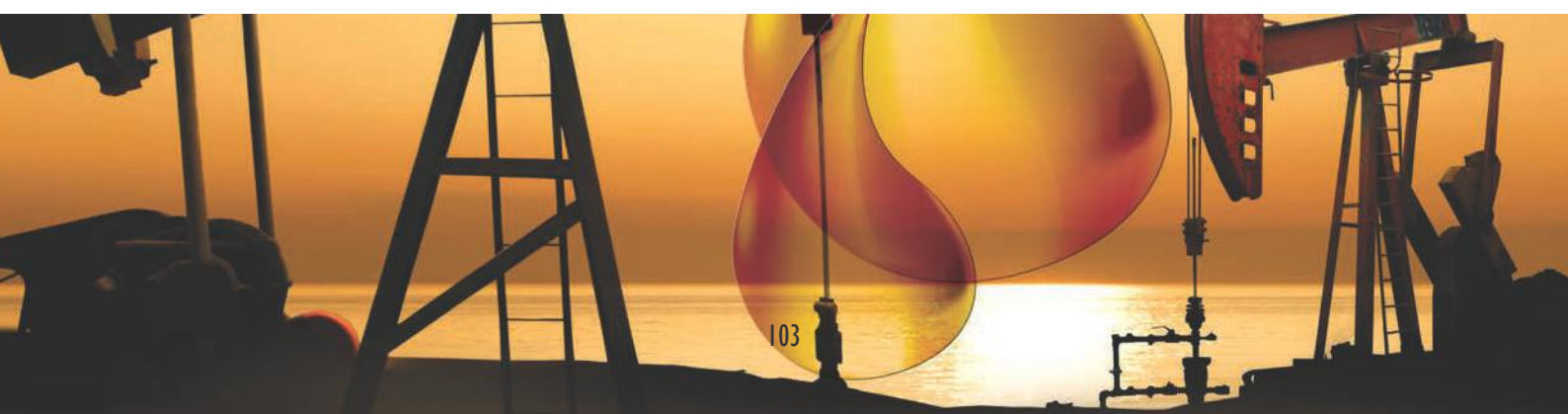
Natural gas prices in international markets are influenced by the weather conditions in US, petroleum prices, demand for heating or cooling in US, economic growth conditions, and supply & storage levels. However, in India domestic prices of natural gas are still largely under the government control.

# CRUDE OIL

## FUNDAMENTALS

CRUDE OIL FUNDAMENTALS ('000 BARRELS/DAY)					
	2015	2016	2017	2018	2019
<b>World Scenario</b>					
Oil Production	91547	91822	92502	95254	95192
Proven Oil Reserves ('000 mn barrels)	1684	1692	1728	1736	1734
Oil Consumption	95048	96737	98406	97348	98272
Refinery Capacity	97650	98129	98621	99814	101340
Refinery Throughput	79989	80501	81992	82961	82989
Reserves from Canadian oil sands ('000 mn barrels)	165	164	163	163	162
World Trade	62515	66526	69633	71154	70925
<b>OPEC</b>					
Oil Production	38601	39736	39673	37563	35566
Proven Oil Reserves ('000 mn barrels)	1208	1214	1240	1242	1215
<b>OECD</b>					
Oil Production	23583	23090	23940	26682	28381
Proven Oil Reserves ('000 mn barrels)	244	244	254	254	260
Oil Consumption	46086	46688	47199	46115	45822
Refinery Capacity	44120	44202	44002	44812	45138
Refinery Throughput	37968	37758	38528	38516	38124
<b>Indian Scenario</b>					
Oil Production	893	874	884	869	826
Proven Oil Reserves ('000 mn barrels)	5	5	5	4	5
Refinery Capacity	4307	4620	4699	4972	5008
Refinery Throughput	4561	4930	5010	5154	5119
Crude Oil Imports	4380	4945	4947	5196	5379
Oil Consumption	4245	4654	4870	5112	5271

Source: BP Statistical Review 2020, Ministry of Petroleum & Natural Gas, EIA

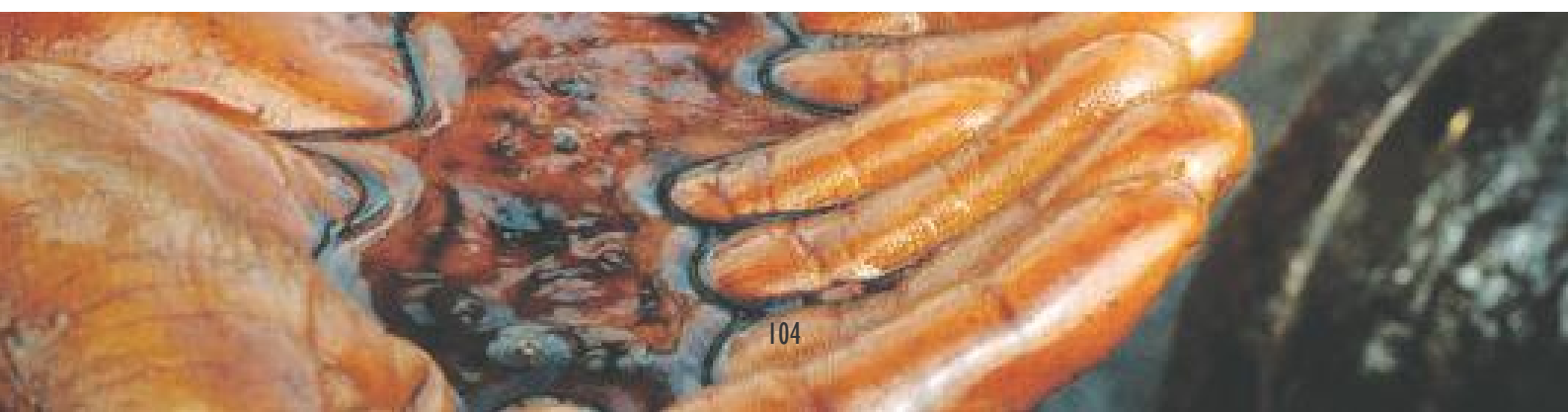


# CRUDE OIL

## FUNDAMENTALS

CRUDE OIL FUNDAMENTALS ('000 BARRELS/DAY)					
Country	2015	2016	2017	2018	2019
<b>Major Producing Countries</b>					
US	12773	12340	13135	15360	17045
Saudi Arabia	11998	12406	11892	12261	11832
Russian Federation	11007	11269	11255	11438	11540
Iran	3853	4586	5024	4801	3535
Iraq	3986	4423	4533	4632	4779
World	91547	91822	92502	95254	95192
<b>Major Consuming Countries</b>					
US	19531	19687	19958	19428	19400
China	11986	12304	12840	13375	14056
India	4245	4654	4870	5112	5271
Japan	4151	4019	3975	3855	3812
Saudi Arabia	3886	3875	3838	3769	3788
World	95048	96737	98406	97348	98272
<b>Major Importing Countries</b>					
Europe	13993	14354	14699	14896	14867
US	9451	10056	10148	9943	9094
China	8333	9214	10240	11024	11825
India	4380	4945	4947	5196	5379
Japan	4332	4180	4142	3940	3779
World	62515	66526	69633	71154	70925
<b>Major Exporting Countries</b>					
Middle East (ex Saudi Arabia)	13537	15321	16183	16098	15010
Russia	8313	8814	8979	9080	9186
Saudi Arabia	7968	8606	8333	8638	8397
Asia Pacific (ex Japan)	6780	7356	7716	7568	7963
US	4521	5078	5858	7054	8016
World	62515	66526	69633	71154	70925
<b>Major sources of Imports for India (million tonnes)</b>					
Middle East	115	136	134	147	133
West Africa	34	29	26	28	30
South & Central America	29	28	25	23	19
Other Asia Pacific	5	7	6	5	5
Mexico	6	6	7	9	10
World	195	212	211	227	222

Source: BP Statistical Review 2020

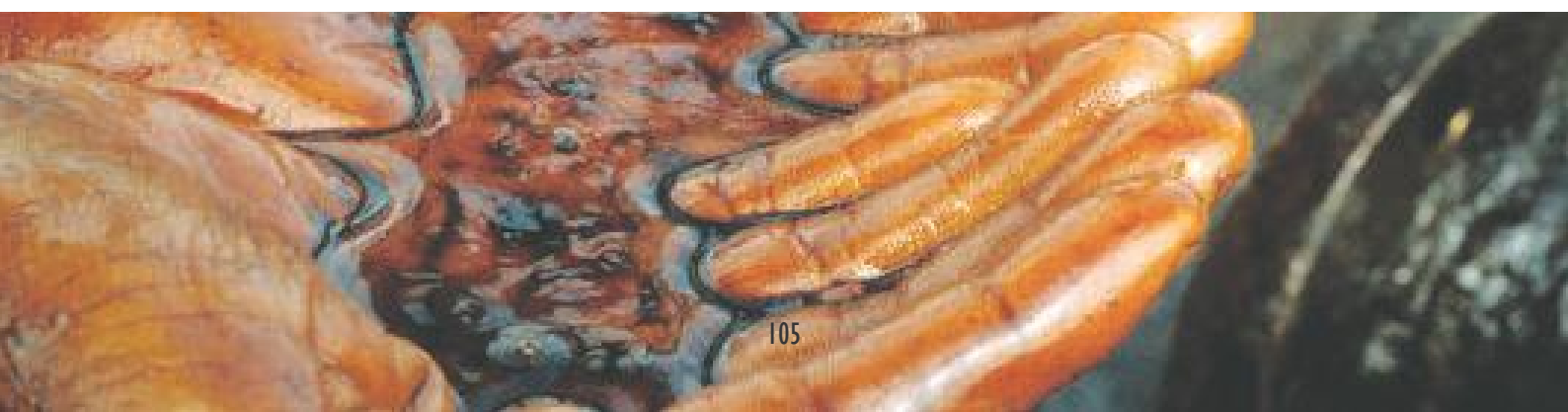


# CRUDE OIL

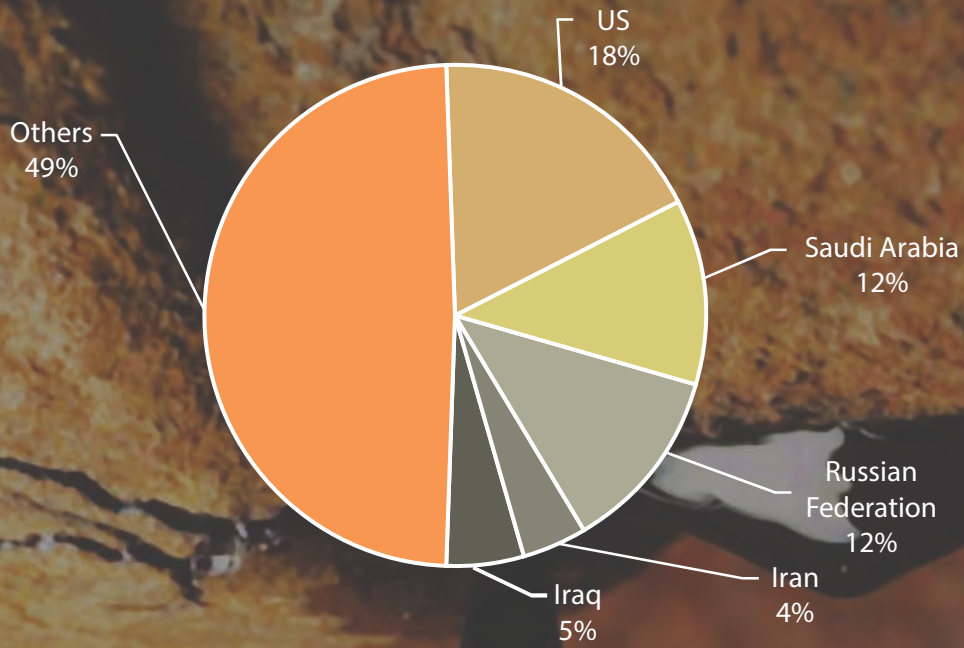
## FUNDAMENTALS

GLOBAL ECONOMIC PARAMETERS IMPACTING PRICES (%)					
	2015	2016	2017	2018	2019
<b>Real GDP Growth</b>					
China	7.0	6.8	6.9	6.8	6.1
Euro area	2.1	1.9	2.5	1.9	1.3
India (fiscal year)	8.0	8.3	7.0	6.1	5.0
Japan	1.2	0.5	2.2	0.3	0.7
United Kingdom	2.4	1.9	1.9	1.3	1.4
United States	2.9	1.6	2.2	2.9	2.3
<b>Consumer Price Inflation</b>					
China	1.4	2.0	1.6	2.1	2.9
Euro area	0.0	0.2	1.4	1.7	1.4
India (fiscal year)	4.9	4.5	3.6	3.4	4.8
Japan	0.8	-0.1	0.5	1.0	0.5
United Kingdom	0.4	1.0	2.6	2.3	1.7
United States	0.1	1.3	2.1	2.4	1.8
<b>Industrial Output Growth</b>					
China	5.9	6.0	5.9	5.8	5.7
Euro area	2.5	2.7	3.1	2.0	-0.2
India (fiscal year)	9.6	7.7	6.3	4.9	1.8
Japan	0.4	0.6	1.6	1.1	-0.4
United Kingdom	1.9	2.0	3.2	0.2	-0.2
United States	3.1	-1.0	-2.0	2.3	3.9
<b>Interest Rates (end of period)</b>					
China	4.35	4.35	4.35	4.35	4.35
India (repo rate)	6.75	6.25	6.25	6.50	5.15
Japan (basic loan/discount rate)	0.00	-0.10	-0.10	-0.10	-0.10
United Kingdom	0.50	0.25	0.50	0.75	0.75
United States	0.50	0.75	1.50	2.25	1.50
<b>Equity Index (end of year)</b>					
US (Dow Jones)	17425	19763	24719	23327	28538
India (BSE-Sensex)	26118	26626	34057	36068	41254

*Source: Data releases of World Bank, Statistical departments of respective countries, BSE, NYSE*

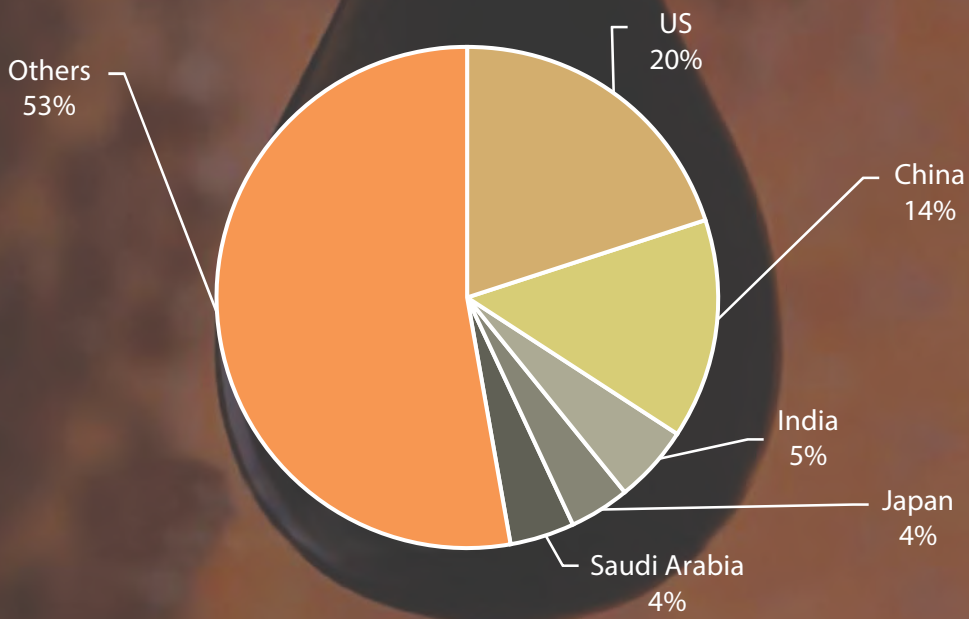


### Crude Oil Production 2019



Source: BP Statistical Review

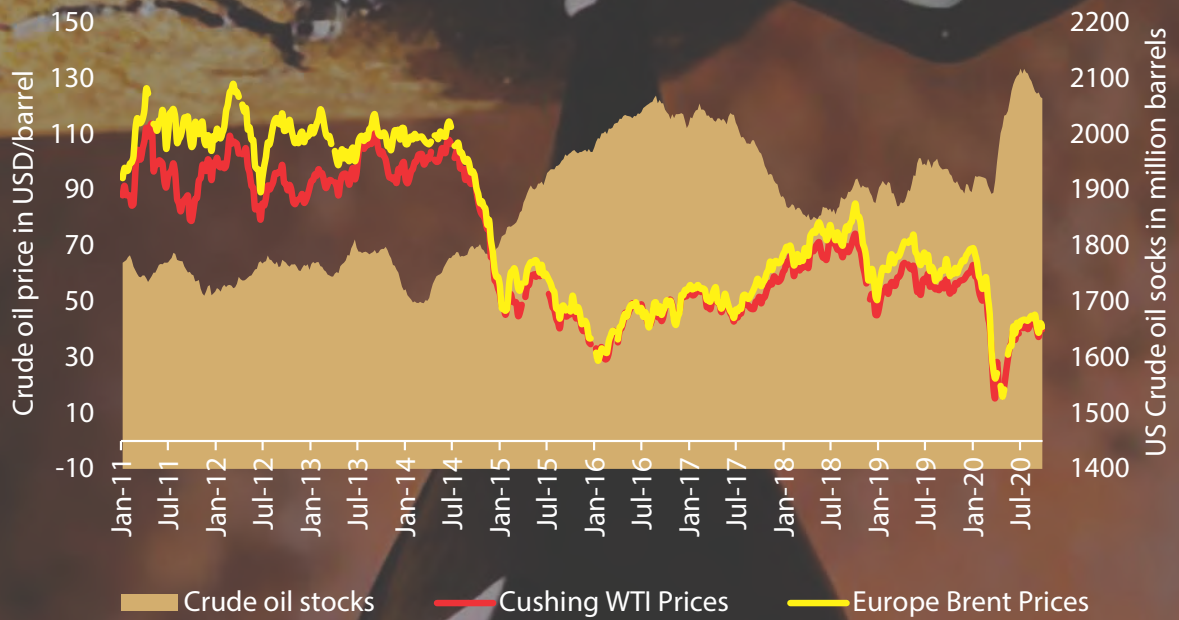
### Crude Oil Consumption 2019



Source: BP Statistical Review



### Crude Oil Prices and Inventory



Source: Energy Information Administration, US

# NATURAL GAS

## FUNDAMENTALS

<b>NATURAL GAS FUNDAMENTALS (BILLION CUBIC METRE)</b>					
<b>Particulars</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
<b>World Scenario</b>					
Natural gas production	3531	3552	3680	3858	3989
Natural gas consumption	3480	3543	3670	3852	3929
Natural gas trade (export/import) - pipeline	446	480	510	508	499
Natural gas trade (export/import) - LNG	337	358	393	431	485
Proven gas reserves	185419	186574	195790	197080	198756
Proven gas reserves - former Soviet Union	59021	59535	62989	63556	64188
Proven gas reserves-OECD	16353	16405	19761	20056	20092
OECD natural gas production	1271	1287	1323	1419	1506
OECD natural gas consumption	1615	1649	1670	1757	1801
<b>Indian Scenario</b>					
Proven gas reserves	1205	1181	1241	1289	1329
Natural gas production	28	27	28	27	27
Natural gas consumption	48	51	54	58	60
Natural gas (LNG) imports	20	24	26	31	33

*Source: BP Statistical Review 2020, Ministry of Petroleum & Natural Gas*



# NATURAL GAS

## FUNDAMENTALS

NATURAL GAS FUNDAMENTALS (BILLION CUBIC METRE)					
Country	2015	2016	2017	2018	2019
<b>Major Producing Countries</b>					
US	766	749	735	836	921
Russian Federation	575	579	636	669	679
Iran	189	202	224	238	244
Qatar	178	181	176	176	178
Canada	149	152	176	179	173
Total	3531	3552	3680	3858	3989
<b>Major Consuming Countries</b>					
US	773	779	740	820	847
Russian Federation	403	391	425	454	444
China	195	210	240	283	307
Iran	191	201	214	224	224
Japan	113	111	117	116	108
Total	3480	3543	3670	3852	3929
<b>Major Importing Countries (Pipeline)</b>					
Germany	102	99	95	101	110
US	74	82	81	77	73
Italy	56	59	54	56	54
Mexico	30	38	42	46	51
China	34	38	39	48	48
<b>Major Importing Countries (LNG)</b>					
Japan	111	108	114	113	105
South Korea	44	44	51	60	56
China	26	34	53	73	85
Spain	13	13	17	15	22
United Kingdom	13	10	7	7	18
<b>Major Exporting Countries (Pipeline)</b>					
Russian Federation	179	191	215	223	217
Norway	110	110	109	114	109
Canada	74	82	81	77	73
US	49	60	66	68	75
Netherlands	47	52	43	32	38
<b>Major Exporting Countries (LNG)</b>					
Qatar	102	104	103	105	107
Australia	38	57	76	92	105
Indonesia	21	21	22	21	16
Algeria	17	16	17	13	17
Trinidad and Tobago	17	14	13	17	17

Source: BP Statistical Review 2020



# NATURAL GAS

## FUNDAMENTALS

MAJOR PRODUCING STATES IN INDIA (IN MILLION STANDARD CUBIC METRE)					
State	2015-16	2016-17	2017-18	2018-19	2019-20
<b>A. Onshore</b>	9237	9858	9904	10756	10549
Assam & Arunachal Pradesh	3054	3155	3249	3317	3187
Gujarat	1490	1580	1607	1402	1342
Tripura	1332	1430	1440	1554	1473
Rajasthan	1338	1277	1442	1483	1883
Tamil Nadu	1011	983	1207	1208	1097
Andhra Pradesh	619	868	959	1082	912
West Bengal (CBM)	389	555	531	350	306
Madhya Pradesh(CBM)	1	6	200	357	345
Jharkhand (CBM)	2	3	4	4	5
<b>B. Offshore</b>					
Mumbai High + Eastern Offshore	16406	16883	17791	19044	18576
Private / JVCs	6605	5155	6338	3075	2059
<b>C. Total (A&amp;B)</b>	32249	31897	32649	32875	31184

Source: Petroleum Policy and Analysis Cell (PPAC) Ministry of Petroleum and Natural Gas

Country	2015	2016	2017	2018	2019
<b>Major Sources of Import for India (billion cubic metres)</b>					
Qatar	13.5	14	13.2	14.8	13.2
Nigeria	3.1	2.7	3.6	4.0	3.6
Equatorial Guinea	0	1.4	1.2	-	-
Australia	1.2	1.2	2.5	2.0	1.4
UAE	0.2	0.7	0.5	0.5	3.6
Total	21.3	22.5	25.7	30.6	32.9

Source: BP Statistical Review 2020



# NATURAL GAS

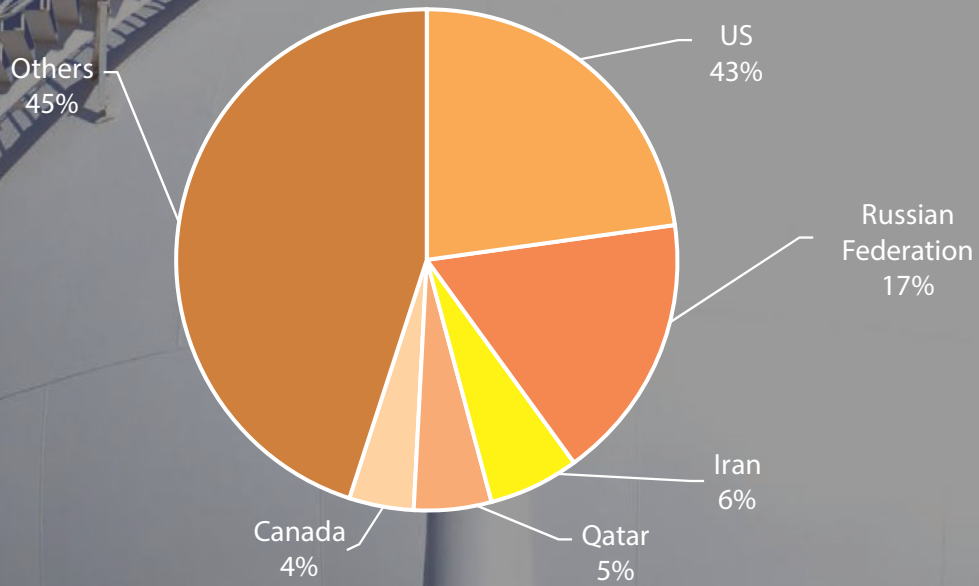
## FUNDAMENTALS

GLOBAL ECONOMIC PARAMETERS IMPACTING PRICES (%)					
	2015	2016	2017	2018	2019
<b>Real GDP Growth</b>					
China	7.0	6.8	6.9	6.8	6.1
Euro area	2.1	1.9	2.5	1.9	1.3
India (fiscal year)	8.0	8.3	7.0	6.1	5.0
Japan	1.2	0.5	2.2	0.3	0.7
United Kingdom	2.4	1.9	1.9	1.3	1.4
United States	2.9	1.6	2.2	2.9	2.3
<b>Consumer Price Inflation</b>					
China	1.4	2.0	1.6	2.1	2.9
Euro area	0.0	0.2	1.4	1.7	1.4
India (fiscal year)	4.9	4.5	3.6	3.4	4.8
Japan	0.8	-0.1	0.5	1.0	0.5
United Kingdom	0.4	1.0	2.6	2.3	1.7
United States	0.1	1.3	2.1	2.4	1.8
<b>Industrial Output Growth</b>					
China	5.9	6.0	5.9	5.8	5.7
Euro area	2.5	2.7	3.1	2.0	-0.2
India (fiscal year)	9.6	7.7	6.3	4.9	1.8
Japan	0.4	0.6	1.6	1.1	-0.4
United Kingdom	1.9	2.0	3.2	0.2	-0.2
United States	3.1	-1.0	-2.0	2.3	3.9
<b>Interest Rates (end of period)</b>					
China	4.35	4.35	4.35	4.35	4.35
India (repo rate)	6.75	6.25	6.25	6.50	5.15
Japan (basic loan/discount rate)	0.00	-0.10	-0.10	-0.10	-0.10
United Kingdom	0.50	0.25	0.50	0.75	0.75
United States	0.50	0.75	1.50	2.25	1.50
<b>Equity Index (end of year)</b>					
US (Dow Jones)	17425	19763	24719	23327	28538
India (BSE-Sensex)	26118	26626	34057	36068	41254

*Source: Data releases of World Bank, Statistical departments of respective countries, BSE, NYSE*

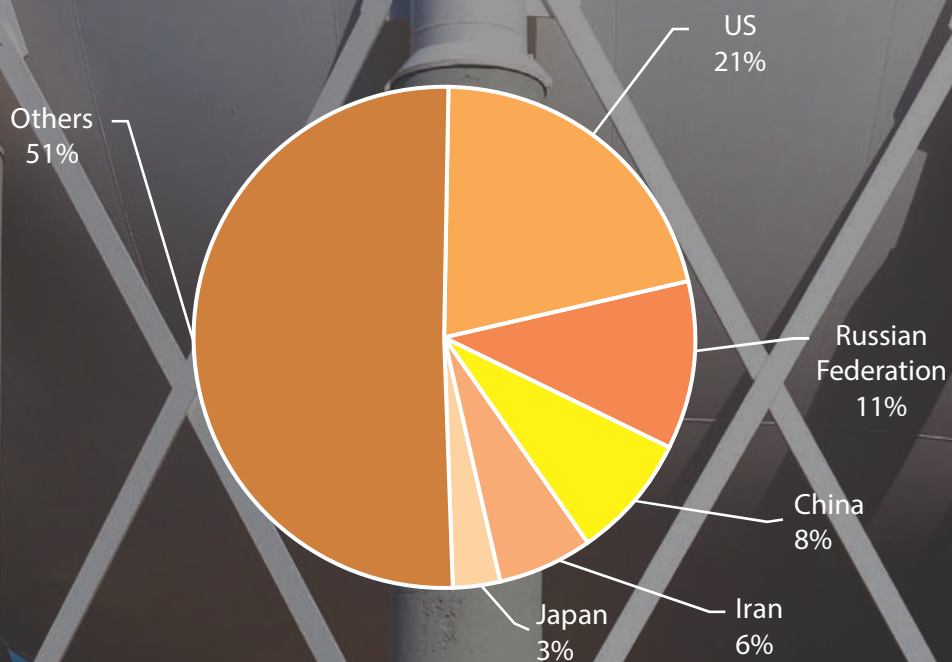


## Natural Gas Production in 2019



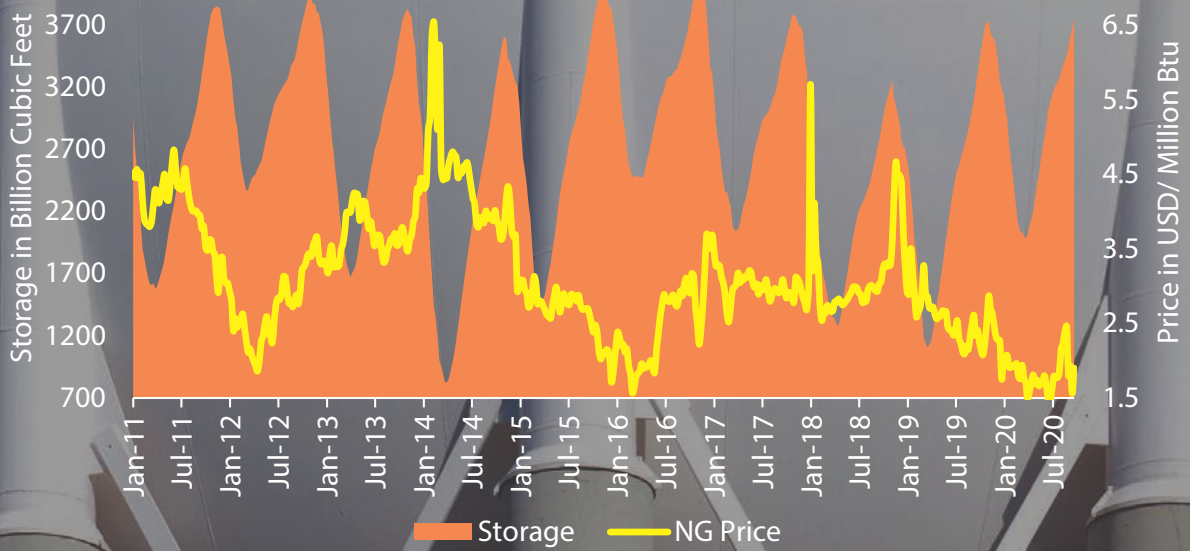
Source: BP Statistical Review 2020

## Natural Gas Consumption in 2019



Source: BP Statistical Review 2020

### US Natural Gas Storage Levels and Prices



Source: Energy Information Administration, US

Intentionally kept blank



# STATISTICS

## AGRICULTURAL COMMODITIES

COTTON

OILSEEDS COMPLEX  
CPO & Castor Seed

SPICES  
Cardamom, Mentha Oil, Pepper

Intentionally kept blank

# COTTON



## COTTON

Cotton is an important fibre crop grown all over the world as a raw material mainly for textile industry and it is used in fabric since ancient times. Cotton is used, either in its pure form or as blend with synthetic fibers such as polyester and other fibers like rayon, in the manufacturing of a number of textile products. Apart from the textile industry, cotton is also used in the manufacturing of products such as fishnets, coffee filters, tents, cotton paper, bookbinding etc.

Although cotton is reportedly cultivated in more than 100 countries accounting for about 2.5% of the world's cultivated land, top five countries account for nearly 80% of total world cotton production. Further, cotton is a largely traded agricultural commodity, with over 150 countries involved in exporting or importing cotton. Cotton has been cultivated in India since ancient times and is known to have originated from the Indian sub-continent. Studies have indicated that India was the original habitat for the old world cotton. It is cultivated in tropical and sub-tropical climate.

India has regained its position of one of the largest producers in the world during the last decade owing to a significant rise in yields and thereby raising production levels in the country. India is now the largest producer and the second largest consumer and exporter of cotton in the world. Other major countries producing cotton include China, US, Pakistan and Brazil. In India, cotton production is distributed across a number of states but mainly concentrated in central India particularly in states like Gujarat, Maharashtra and Telangana.

India's cotton exports have increased significantly from mid 2000s following the substantial expansion in domestic production. India has become the largest exporter in 2011-12. However, India's exports have declined in the subsequent years. Major export destinations of India include Bangladesh, China, Pakistan, Vietnam and Sri Lanka in the recent years.

Cotton futures trading in India has 135 years of history in India. Bombay Cotton Trade association Ltd was set up in 1875 for organizing futures trading in cotton. Along with other commodities, futures trading in cotton was also discontinued during 1970s. Nevertheless, cotton futures trading once again has become active with revival of commodities futures trading and introduction of online trading on national multi-commodity exchanges in the early 2000s. Futures contracts of cotton are available on domestic exchanges for kapas (raw cotton) and lint (ginned cotton).

# COTTON

## FUNDAMENTALS

<b>COTTON FUNDAMENTALS (IN 000'S OF 480 LB BALES)</b>					
<b>Particular</b>	<b>2015-16</b>	<b>2016-17</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>
<b>Global Scenario</b>					
Beginning Stocks	106739	90148	80289	80929	80270
Production	96162	106679	123784	119013	121983
Imports	35444	37697	41146	42359	40026
Total Supply	238345	234524	245219	242301	242279
Exports	34701	37852	41408	41228	40740
Domestic Consumption	113496	116383	122882	120346	102127
Ending Stocks	90148	80289	80929	80727	99443
<b>Indian Scenario</b>					
Beginning Stocks	10586	7044	7880	9225	9314
Production	25900	27000	29000	26500	29500
Imports	1072	2736	1677	1800	2300
Total Supply	37558	36780	38557	37525	41114
Exports	5764	4550	5182	3500	3250
Domestic Consumption	24750	24350	24150	24000	20000
Ending Stocks	7044	7880	9225	10025	17864
<b>Major Producing Countries</b>					
World	96162	106679	123784	119013	121983
India	25900	27000	29000	26500	29500
China	22000	22750	27500	27750	27250
United States	12888	17170	20923	18367	19913
Pakistan	5920	7020	9220	12750	6200
Brazil	7000	7700	8200	7600	13400
<b>Major Consuming Countries</b>					
World	113496	116383	122882	120346	102127
China	36000	38500	41000	39500	33000
India	24750	24350	24150	24000	20000
Pakistan	10325	10325	10925	10725	9200
Bangladesh	6310	6810	7510	7410	6500
Turkey	6700	6550	7450	6800	6600
<b>Major Importing Countries</b>					
World	35444	37697	41146	42359	40026
Bangladesh	6375	6800	7600	7200	7000
Vietnam	4600	5500	7000	6900	7136
China	4406	5032	5710	9640	2300
Turkey	4218	3679	4024	3499	4577
Indonesia	2941	3391	3498	3050	2600
<b>Major Exporting Countries</b>					
World	34701	37852	41408	41228	40740
United States	9153	14917	16279	14763	15527
India	5764	4550	5182	3500	3250
Brazil	4314	2789	4174	6014	8937
Australia	2828	3731	3915	3632	1360
Mali	1000	1100	1300	1350	1175

Note: 1 Indian bale = 170 Kg of Kapas; 1 US Bale (480 pound) = 217.7 Kg; 1 Indian Candy = 355.62 Kg of lint cotton

Source: USDA PSD (as downloaded in September, 2020) (Aug-Jul)



# COTTON

## FUNDAMENTALS

COTTON FUNDAMENTALS					
	2015-16	2016-17	2017-18	2018-19	2019-20
<b>Cotton Balance Sheet India (in 000 bales of 170 kg)</b>					
Opening Stock	6600	3640	3600	3300	3200
Crop	33200	34500	36500	31200	33550
Import	2280	3090	1500	2900	1500
<b>Total Supply</b>	<b>42080</b>	<b>41240</b>	<b>41600</b>	<b>37400</b>	<b>38250</b>
Mill Consumption	27020	26270	27500	27600	24300
S.S.I Consumption	2710	2620	2900	2700	2100
Non Textile Consumption	1800	1750	1500	1200	1600
Export	6910	5820	6900	4400	4700
<b>Total Demand</b>	<b>38440</b>	<b>36460</b>	<b>38800</b>	<b>35900</b>	<b>28000</b>
Closing Stock	3640	4780	2800	1500	5550

Source: Cotton Association of India (CAI) \*as estimated by CAI released in its last meeting held on 30-06-2020

	2015-16	2016-17	2017-18	2018-19	2019-20
<b>Major Producing States</b>					
All India	33200	34500	36500	31200	33550
Gujarat	9000	9500	10500	8350	8500
Maharashtra	7600	8850	8300	7700	8000
Telangana	5800	4800	5150	4750	5100
Karnataka	1950	1900	1875	1700	1875
Andhra Pradesh	2375	1800	1850	1650	1425

Source: Cotton Advisory Board (CAB)

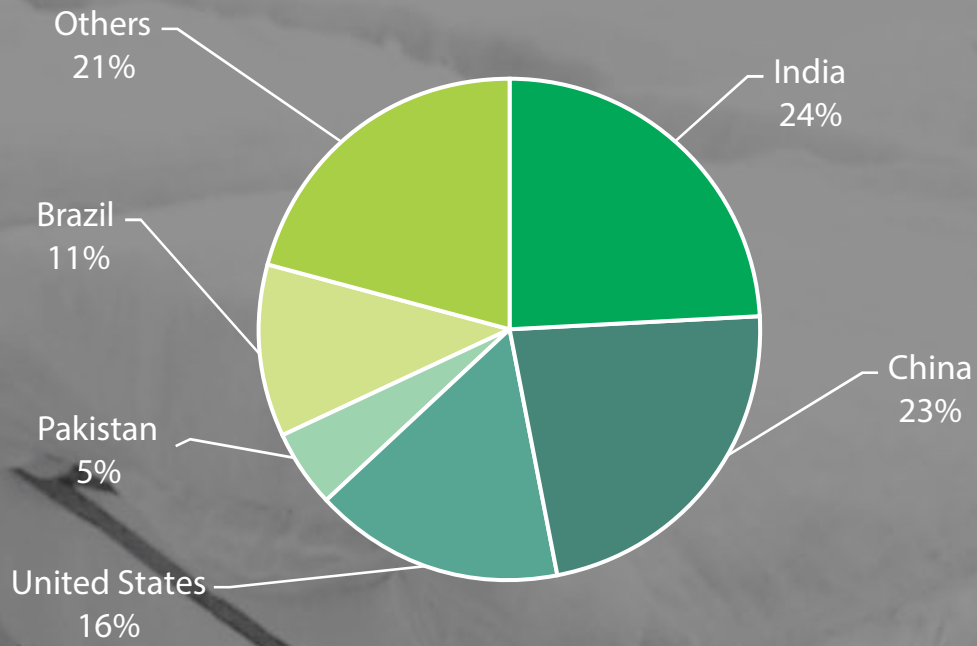
### MAJOR IMPORT SOURCES AND EXPORT DESTINATIONS FOR INDIA (VALUE IN RS. LAKH)

2015-16		2016-17		2017-18		2018-19		2019-20	
Country	Value	Country	Value	Country	Value	Country	Value	Country	Value
<b>Major Export Destinations</b>									
China P Rp	1101745	Bangladesh Pr	1070508	Bangladesh Pr	1174638	Bangladesh Pr	1311889	Bangladesh Pr	1173995
Bangladesh Pr	1061229	China P Rp	903809	China P Rp	647642	China P Rp	1244429	China P Rp	552162
Pakistan Ir	520220	Pakistan Ir	320460	Pakistan Ir	350297	Pakistan Ir	384233	Sri Lanka Dsr	167427
Vietnam Soc Rep	172764	Vietnam Soc Rep	189219	Vietnam Soc Rep	280744	Sri Lanka Dsr	316536	EGYPT A RP	154227
Sri Lanka Dsr	152112	Sri Lanka Dsr	161284	Sri Lanka	143521	Sri Lanka	168124	Vietnam Soc Rep	146672
Total	4798343	Total	4439176	Total	4541151	Total	5502070	Total	4071481
<b>Major Import Sources</b>									
China P Rp	84852	USA	194060	USA	297575	USA	238421	USA	437397
USA	73716	Australia	189126	Australia	91174	China P Rp	84797	Egypt A Rp	83451
Mali	47209	China P Rp	83518	China P Rp	84172	Egypt A Rp	43568	Australia	60688
Pakistan Ir	26460	Egypt A Rp	38574	Egypt A Rp	48819	Australia	41346	Cote D' Ivoire	57002
Australia	19784	Mali	38147	Mali	44128	Bangladesh Pr	16356	Brazil	39707
Total	390765	Total	758280	Total	760677	Total	583464	Total	1078833

Source: Export-Import Data Bank, Ministry of Commerce, GoI

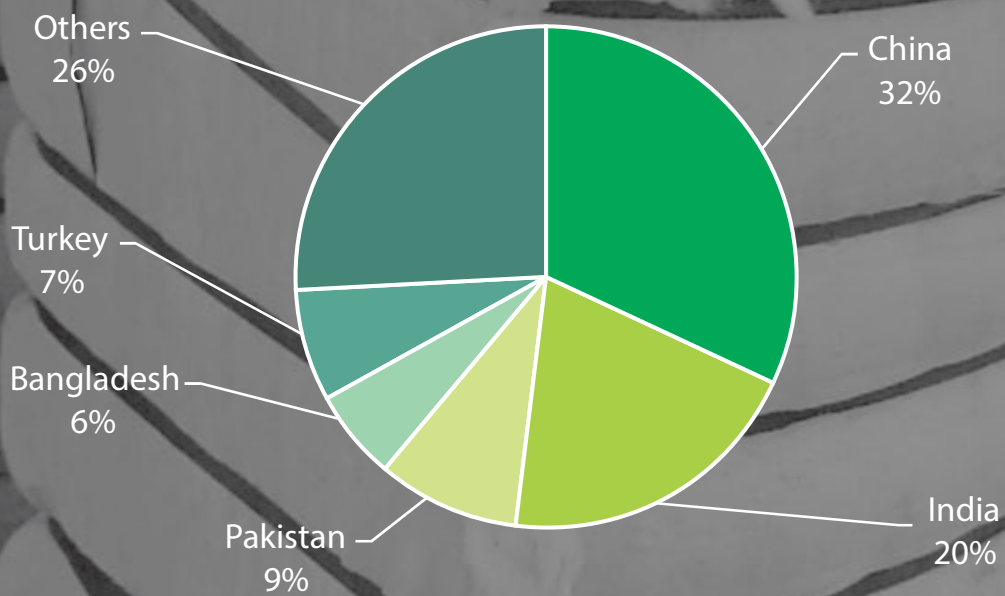


### World Cotton Production in 2019-20



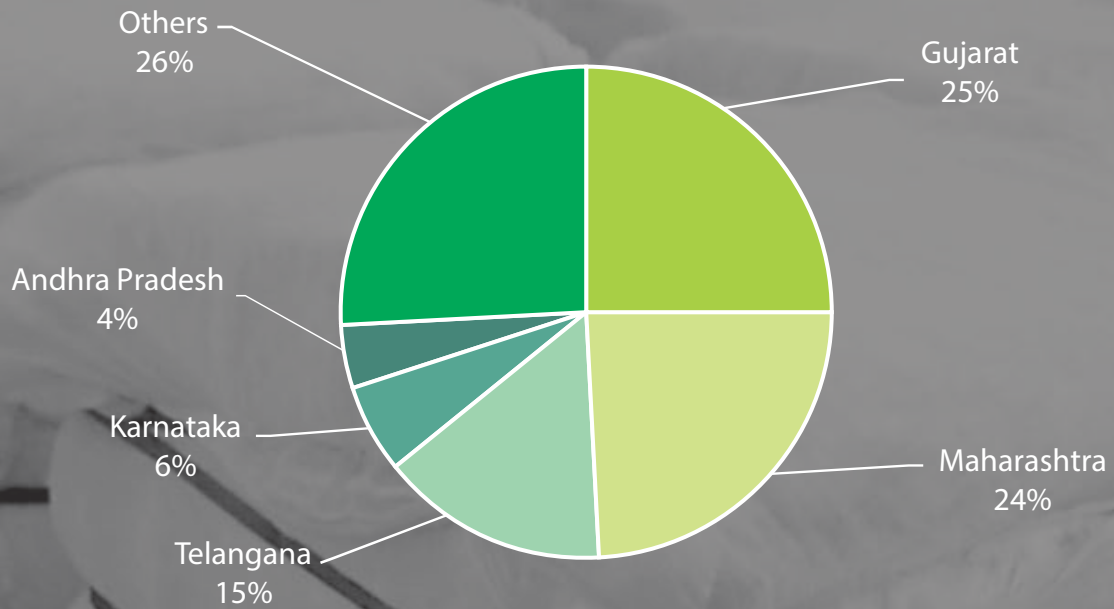
Source: USDA

### Cotton Consumption in 2019-20



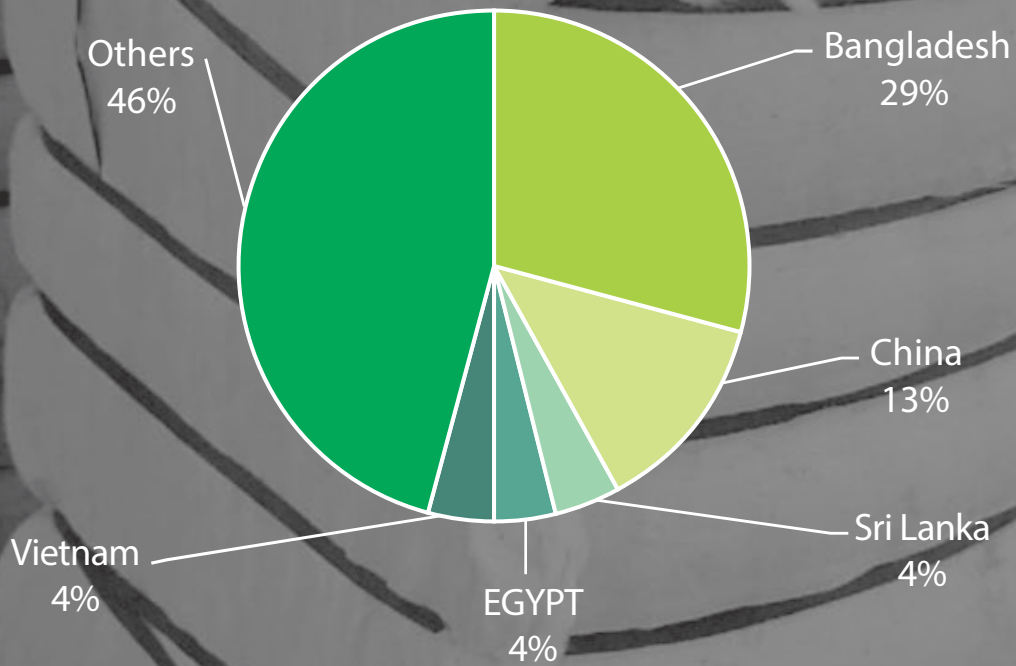
Source: USDA

### Cotton Production in India in 2019-20



Source: Department of Agriculture & Cooperation, Ministry of Agriculture

### Cotton Exports from India in 2019-20



Source: Export-Import Data Bank, Ministry of Commerce, Govt



# OILSEEDS COMPLEX



## VEGETABLE OILS

Vegetable oils, derived from oilseeds and other plant parts, are important source of fats in human nutrition. Vegetable oils are also used in a number of non-edible product preparation and as lubricants. Oilseeds are characterized by containing large proportions of oil ranging from 18% in soyabeans to more than 40% in groundnut, sunflower and mustard seeds. Soyabean is richer in proteins than oil and it is crushed mainly for its meal. Oil meal or cake is the solid leftover after extracting oil from oilseeds and is used as animal feed or fertilizer.

Major edible oilseeds produced include soya bean, rapeseed & mustard, sunflower, groundnut and sesamum. Apart from the seeds, vegetable oils are also extracted from other plant parts such as fruit pulp (mesocarp) in case of palm oil, kernel in case of coconut etc. Oils extracted from castor seed are non-edible and used for industrial purposes such as lubricants.

India produces on average around 20 million tons of edible oilseeds annually including groundnut, mustard, soya bean, sunflower, sesamum, etc., and about 2 million tons of non-edible oilseeds including castor seed, niger seed and linseed. In spite of this, India is a net importer of edible oils to the tune of about 15 million tons on average every year, which accounts for about 65-70% of total domestic consumption requirement with palm oil being the major part of it.

Over a period, Indian consumers' preference has shifted to palm oil and the country has become the largest importer of palm oil in the world. Domestic production of palm oil is miniscule, India is largely dependent on imports from the world's two largest producers, Malaysia and Indonesia according to USDA. Palm is largely imported in the form of crude palm oil (CPO) due to favourable tariff rates compared to processed and refined oil in order to incentivize the domestic processors. For the benefit of all the stakeholders and participants of value chain to hedge against price risk generated from volatile price movements, futures contracts are available on domestic commodity derivatives exchanges for all major oils and oilseeds.

Prices are influenced by domestic oilseed production, demand-supply scenario in major producing countries, demand and supply scenario of other substitutes in the domestic and global markets, weather and other factors influencing production in major producing and supplying countries. In addition, prices are also influenced by the trade policies in India in terms of changes in quantitative and qualitative restrictions on import of edible oils, particularly of palm oil.

# CRUDE PALM OIL

## FUNDAMENTALS

<b>PALM OIL FUNDAMENTALS (000 TONNES)</b>					
<b>Particular</b>	<b>2015-16</b>	<b>2016-17</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>
<b>Global Scenario</b>					
Beginning Stocks	10060	8281	8992	10989	11040
Production	58901	65267	70610	74080	72771
Imports	42839	45927	46451	50806	47389
Total Supply	111800	119475	126053	135875	131200
Exports	43837	48924	48569	52759	49107
Domestic Consumption	59682	61559	66495	72547	71409
Ending Stocks	8281	8992	10989	10569	10689
<b>Indian Scenario</b>					
Beginning Stocks	539	499	690	228	333
Production	200	200	200	200	200
Imports	8860	9341	8608	9700	8550
Total Supply	9599	10040	9498	10128	9533
Domestic Consumption	9100	9350	9270	9805	9060
Ending Stocks	499	690	228	323	223

Source: USDA (Oct-Sep)

# CRUDE PALM OIL

## FUNDAMENTALS

PALM OIL FUNDAMENTALS (000 TONNES)					
Country	2015-16	2016-17	2017-18	2018-19	2019-20
<b>Major Producing Countries</b>					
World	58901	65267	70610	74080	72771
Indonesia	32000	36000	39500	41500	42500
Malaysia	17700	18858	19683	21000	19000
Thailand	1804	2500	2780	2900	2800
Colombia	1268	1099	1633	1625	1529
Nigeria	955	990	1025	1015	1015
<b>Major Consuming Countries</b>					
World	59682	61559	66495	72547	71409
Indonesia	9270	9160	11000	12625	13680
India	9100	9350	9270	9805	9060
European Union	6600	6800	6900	7000	6770
China	4800	4750	5100	7012	6262
Malaysia	3000	2587	3233	3554	3275
<b>Major Exporting Countries</b>					
World	43837	48924	48569	52759	49107
Indonesia	22906	27633	26967	29200	27500
Malaysia	16667	16313	16472	18000	16700
Guatemala	614	718	800	812	810
Colombia	420	502	697	750	770
Papua New Guinea	580	664	635	640	565
<b>Major Importing Countries</b>					
World	42839	45927	46451	50806	47398
India	8860	9341	8608	9700	8550
European Union	6717	7219	7057	7150	6650
China	4689	4881	5320	6900	6400
Pakistan	2720	3075	3095	3500	3175
Bangladesh	1511	1347	1637	1650	1550

Source: USDA (Oct-Sep)



# CRUDE PALM OIL

## FUNDAMENTALS

<b>PALM OIL FUNDAMENTALS (000 TONNES)</b>					
<b>State</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>	<b>2017-18</b>	<b>2018-19</b>
<b>Major States Producing in India</b>					
Andhra Pradesh	170	194	191	235	233
Telangana	10	11	9	27	37
Kerala	7	7	6	5	5
Karnataka	2	3	2	2	2
Tamil Nadu	1	1	1	1	1
<b>Total</b>	<b>192</b>	<b>219</b>	<b>210</b>	<b>271</b>	<b>279</b>

*Source: National Mission on Oilseeds and Oil Palm, Ministry of Agriculture and Farmers Welfare, GoI*

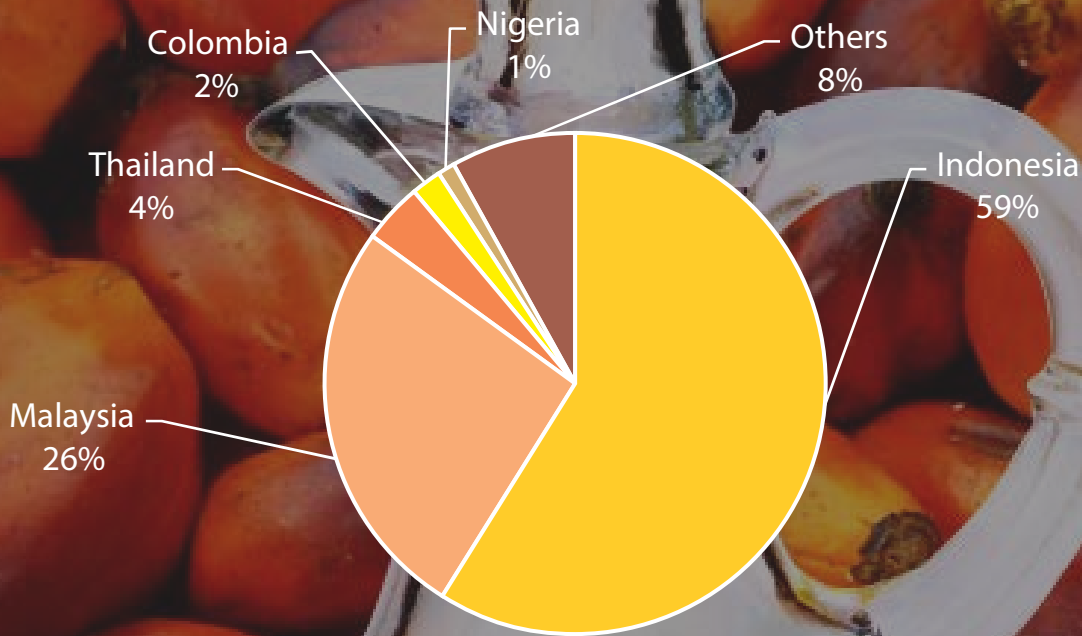
<b>Particular</b>	<b>2015-16</b>	<b>2016-17</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20*</b>
<b>Composition of Palm Oil Imports</b>					
RBD Palmolein	1659	2623	2871	2731	2348
Crude Palm Oil	7724	5749	6335	6535	5287
<b>Total</b>	<b>9383</b>	<b>8372</b>	<b>9206</b>	<b>9266</b>	<b>7635</b>

*Source: Solvent Extractors Association of India (Nov-Oct) \*Nov-Aug 2020*

<b>Particular</b>	<b>2015-16</b>	<b>2016-17</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>
<b>Imports Sources for India (Crude Palm Oil)</b>					
Indonesia	3708	3337	4585	4157	4272
Malaysia	3376	1963	1721	1713	1489

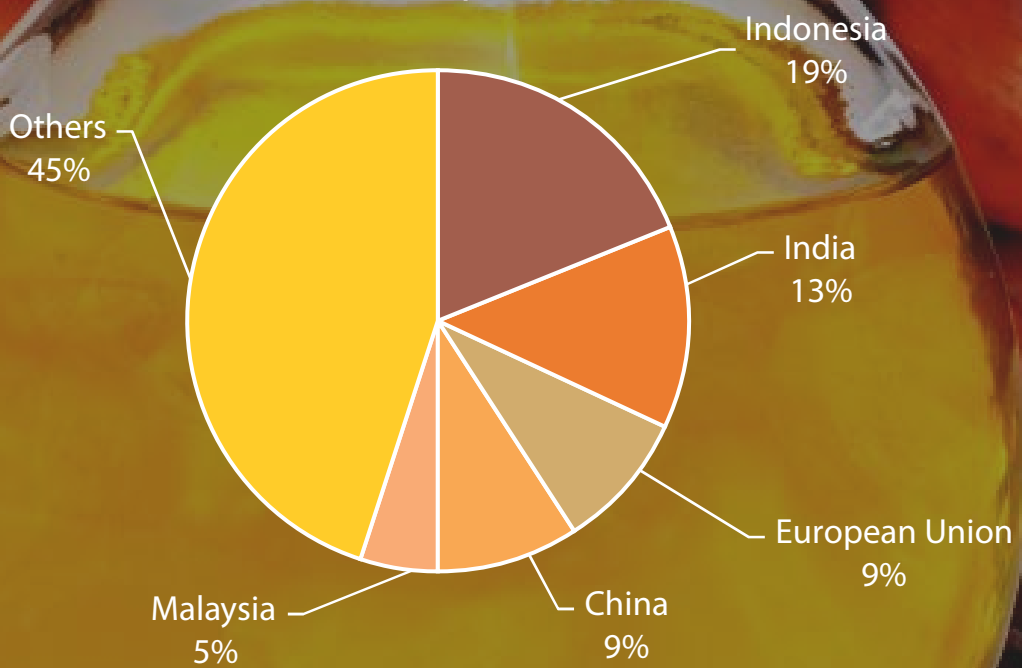
*Source: Ministry of commerce and industry, GoI (Apr-Mar)*

### Palm Oil production 2019-20



Source: USDA

### Palm Oil Consumption 2019-20



Source: USDA

# CASTOR SEED

## FUNDAMENTALS

CASTOR SEED & OIL FUNDAMENTALS (000 TONNES)					
Particular	2014	2015	2016	2017	2018
<b>Global Scenario</b>					
<b>Castor seed Producing countries</b>					
World	1952	1988	1598	3218	3221
India	1733	1752	1376	1568	1198
Mozambique	69	75	77	80	85
China	40	47	40	55	27
Brazil	38	40	25	13	14
Myanmar	11	13	13	13	12
<b>Castor Oil Importers</b>					
World	531	606	645	498	961
China	175	229	260	269	281
France	70	68	84	61	72
US	61	61	61	61	63
Germany	54	55	44	58	61
Netherlands	39	37	38	49	50
<b>Castor Oil Exporters</b>					
World	544	667	684	728	683
India	464	544	564	627	596
Netherlands	29	50	55	44	38
France	19	21	19	18	15
Germany	9	18	16	13	12
United States of America	7	8	12	7	7

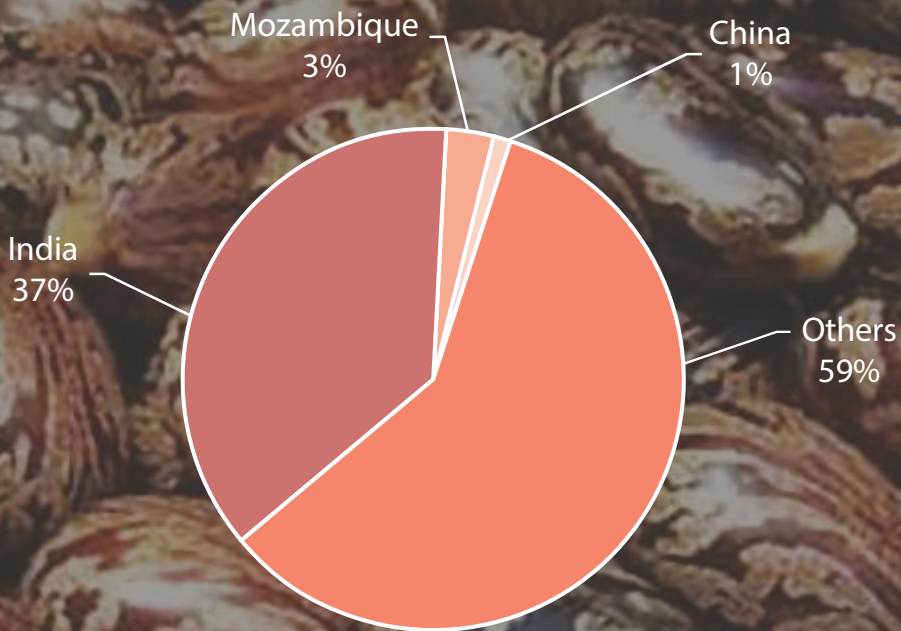
Source: FAOStat ([www.faostat.fao.org](http://www.faostat.fao.org))

CASTOR SEED & OIL FUNDAMENTALS (000 TONNES)					
	2015-16	2016-17	2017-18	2018-19	2019-20
<b>Indian Scenario (000 tonnes)</b>					
Castor seed production	1752	1376	1568	1198	1962
Castor oil production	648	509	580	450	726
Castor oil Exports	543	557	651	572	548
<b>Major Cultivating States (000 hectares)</b>					
All India	1108	845	823	770	992
Gujarat	781	565	596	534	741
Rajasthan	198	170	131	138	154
Andhra Pradesh & Telangana	93	78	58	60	57
<b>Major Producing States (000 tonnes)</b>					
All India	1752	1376	1568	1198	1962
Gujarat	1150	850	1230	889	1659
Rajasthan	150	123	162	147	245
Andhra Pradesh & Telangana	80	64	28	24	33

Source: Department of Agriculture, Ministry of Agriculture, The Central Organisation for Oil Industry and Trade (COOIT), Solvent Extractors Association (SEA)

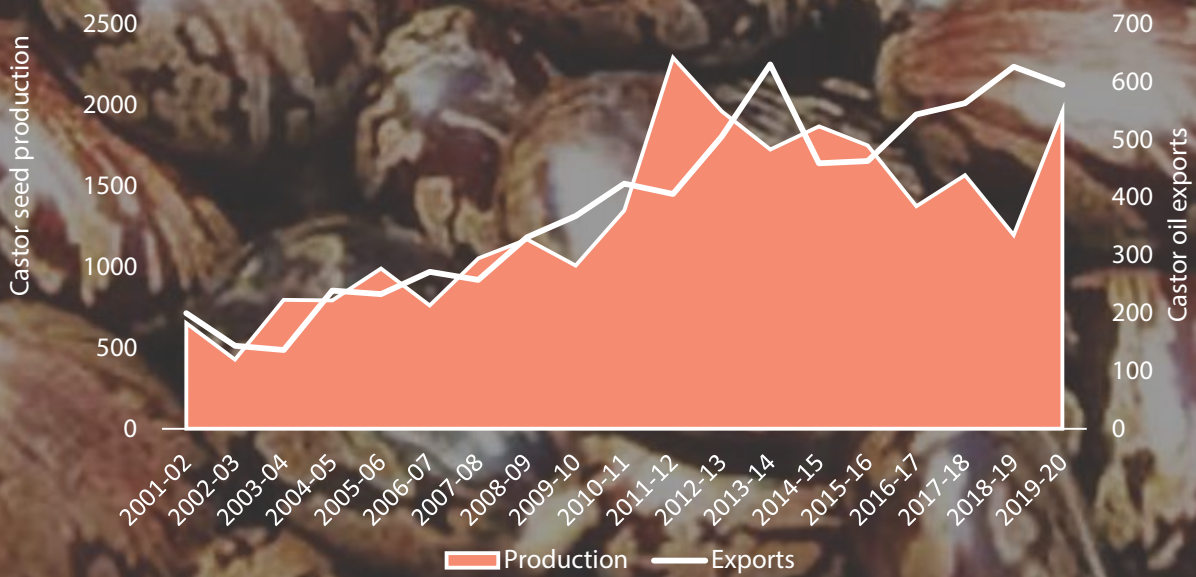


### Major producing countries 2018



Source: FAO

### Castor seed production and oil exports by India (000 tonnes)



Source: Ministry of agriculture, GoI



# SPICES



## SPICES

Spices are important ingredients of Indian cuisine. India particularly southern India is known as land of spices. India has been producing number of spices including pepper, cardamom, cloves, cinnamon, nutmeg, ginger and turmeric since ancient times. India is the largest producer, consumer and exporter of major spices historically. But, in the recent years, production and exports from other countries like Vietnam and Guatemala have increased significantly.

Spices production is concentrated in Kerala, Karnataka and Tamil Nadu for all major perennial spice crops like pepper, cardamom, cloves, cinnamon etc. However, spices that are grown as annual field crops such as turmeric, jeera, chillies, coriander, fenugreek, fennel etc., are spread across country particularly in the states of Andhra Pradesh, Telangana, Maharashtra, Gujarat and Rajasthan.

Pepper is known to be one of the oldest spices traded across countries and is popularly called as the King of Spices. Dried berries have pungent smell and strong tangy taste with number of health benefits. Berries are used for seasoning the food either whole or in powdered form. Essential oils and oleoresins are extracted from pepper are used for medicinal purposes. Major pepper producing countries are Vietnam, India, Indonesia and Brazil.

Cardamom is another important spice and is popularly referred as queen of spices owing to its sweet and pleasant aroma. It is the most valued spice after saffron and vanilla. Economic important parts of cardamom are dried fruits and seeds used to flavor food. Cardamom oil and oleoresins, extracted from seeds, are also used to flavour foods and ayurvedic medicines. India and Guatemala are the major producers of cardamom in the world.

Mentha oil is an essential oil extracted from the leaves of mentha or mint herb. Mentha oil is used in medicines, ingredient of many cosmetics and perfumes and is also an important component of aroma therapy, unani and ayurvedic medicines. It is also used as insect repellents. Apart from mentha oil, other products are also produced from mentha leaves that are of significant export value. India and China are major producing countries. In India, mentha is largely produced in Uttar Pradesh and to some extent in Bihar.

Spices exports from India commands a formidable position in the world. Exports of mentha products are the second largest among spices exported from the country in terms of value standing only next to cardamom. Futures contracts are available on domestic commodity exchanges for number of spices including cardamom, mentha oil, jeera, coriander, turmeric and pepper to hedge against volatile price movements.

Important factors influencing prices include domestic demand-supply, export demand, crop condition in major producing countries, weather conditions affecting output estimations in India and other major producing countries, trade related policies such as tariffs and non-tariff restrictions, change in government policies affecting production, processing and trade within India and other major producing countries.

# CARDAMOM

## FUNDAMENTALS

CARDAMOM FUNDAMENTALS (TONNES)					
Global Scenario	2014-15	2015-16	2016-17	2017-18	2018-19
<b>Production</b>					
Guatemala	30000	36000	32000	34000	32000
India	18000	23890	17990	20650	12940
Total	48000	59890	49990	54650	44940
<b>Exports</b>					
Guatemala	28000	34000	31000	32000	33000
India	3795	5500	3850	5680	2850
<b>Indian Scenario</b>					
Production Estimate	18,000	23890	19625	20650	12950
Import Estimates	2,285	850	1720	685	353
Export Numbers	3,795	5500	3850	5680	2850
Consumption	18,500	18,000	18000	17000	13000
<b>Major States Producing in India</b>					
Kerala	16000	21500	17215	18350	11535
Karnataka	1000	1440	1435	1450	690
Tamil Nadu	1000	950	975	850	715
Total	18000	23890	19625	20650	12940

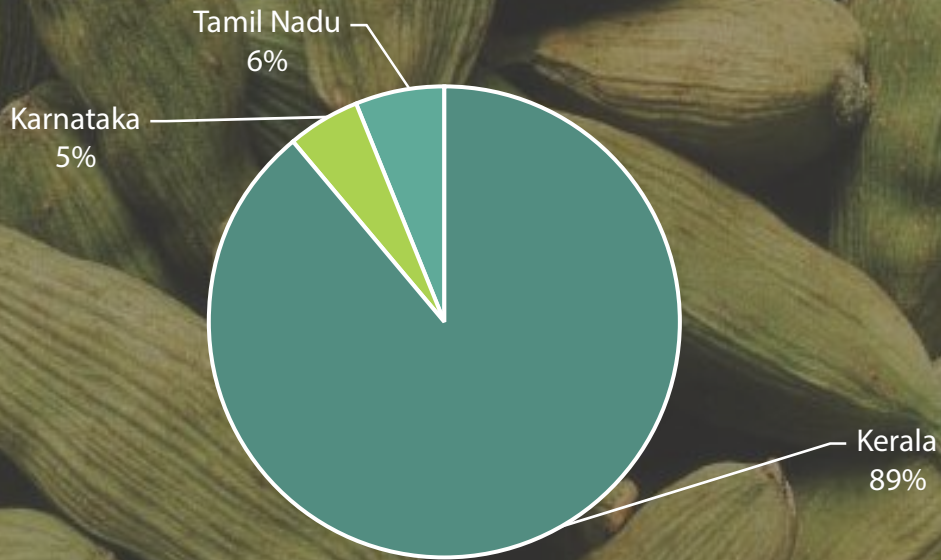
Source: Spices Board of India, Trade Estimates

Country	2014-15	2015-16	2016-17	2017-18	2018-19
<b>Major Exporting Destinations for India</b>					
Saudi Arabia	2800	3969	2500	2923	121
UAE	422	493	494	1084	1191
USA	43	119	96	214	118
Kuwait	86	198	153	196	660
Iran	NA	143	135	302	218
Total (includes others)	3795	5500	3850	5680	2850

Source: Spices Board of India

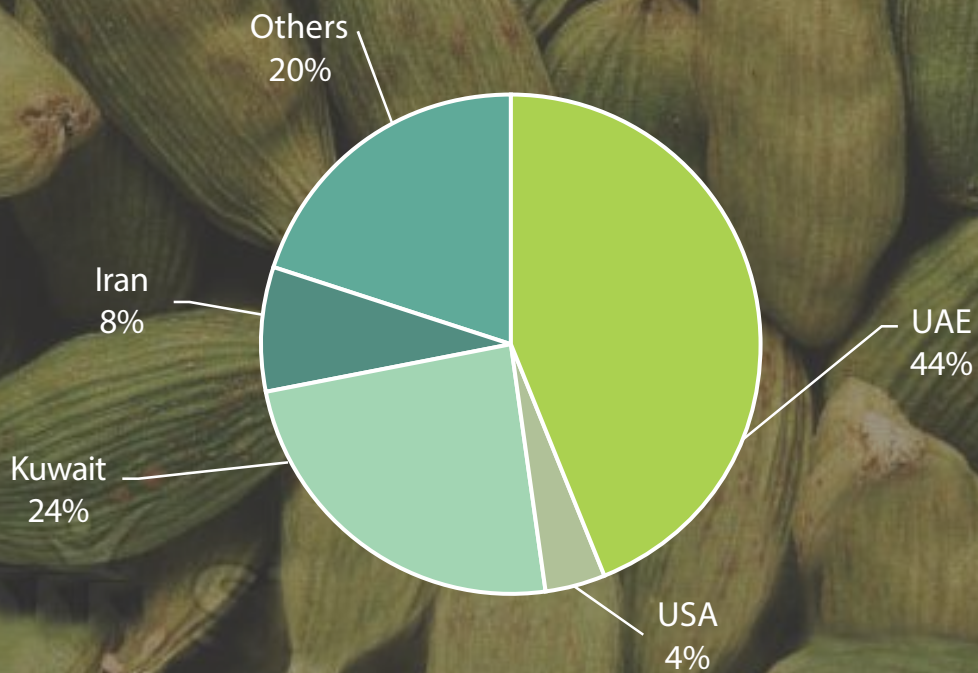


### Cardamom Production in India in 2018-19



Source: Spices Board of India

### India's Cardamom Exports Destinations 2018-19



Source: Spices Board of India

# MENTHA OIL

## FUNDAMENTALS

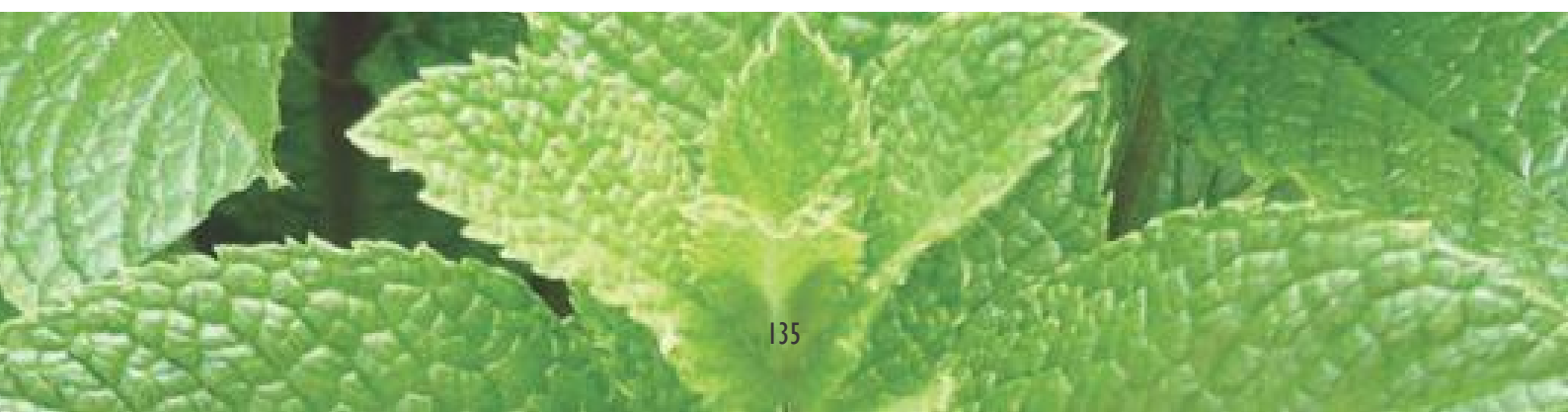
MENTHA OIL FUNDAMENTALS (TONNES)					
(Apr -Mar)	2015-16	2016-17	2017-18	2018-19	2019-20
<b>Production</b>					
Production	30000	32000	35000	37000	37000
Exports	23250	22300	21500	23000	22725#
Consumption	13500	12500	13000	13500	NA

Source: Trade Estimates, CSIR – CIMAP, Spices Board of India

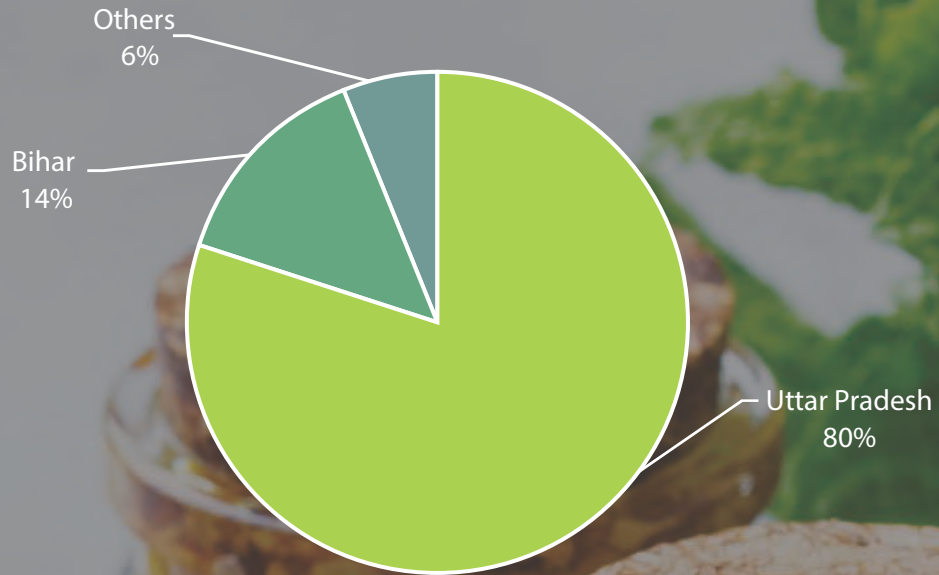
Country	2014-15	2015-16	2016-17	2017-18	2018-19
<b>Mentha oil export Destinations for India</b>					
China	14305	9518	9360	10310	10827
U.S	6824	4860	3130	3792	3559
Netherlands	609	639	951	1230	710
Singapore	1125	1892	711	842	1170
Germany	909	1155	707	929	707
France	529	817	668	586	533
Japan	389	877	484	595	548
U.K	558	544	463	442	404
Phillipines	241	263	217	192	316
Total (Incl Others)	25750	21150	22300	21500	21610

E: Estimated

Source: Spices Board of India # Trade Estimates; NA- Not Available

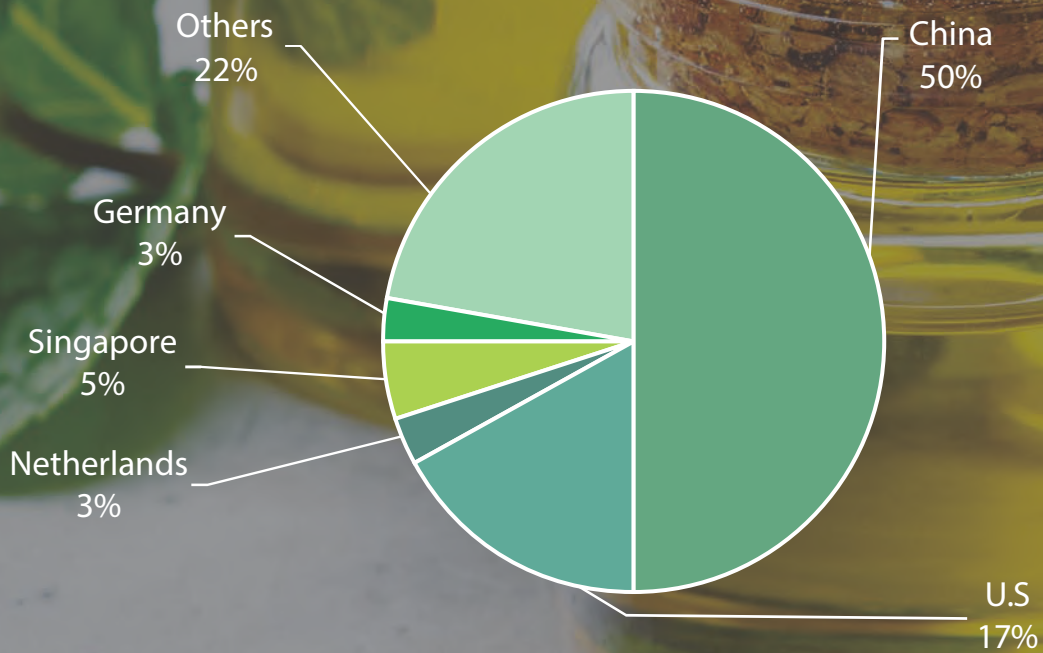


### Mentha oil Production in India



Source: Trade Estimates

### Mentha oil Export Dstinations 2018-19



Source: Spices Board of India

# PEPPER

## FUNDAMENTALS

PEPPER FUNDAMENTALS (TONNES)					
Particular	2014	2015	2016	2017	2018
<b>World Scenario</b>					
Production	560850	610821	656053	727565	768868
Exports	409841	424628	387951	411700	434061
Imports	390184	413158	391191	422333	425197
<b>Major Producing Countries</b>					
World	560850	610821	656053	727565	768868
Viet Nam	151761	176789	216432	252576	262658
Indonesia	87400	81501	86334	87029	88715
Bulgaria	67311	67819	71576	79371	51958
India	51000	65000	55000	72000	67472
Brazil	42339	51739	54425	54820	101274
Country	2014	2015	2016	2017	2018
<b>Major Exporters</b>					
World	409841	424628	387951	411700	434061
Vietnam	159573	133167	146455	116161	160375
Indonesia	34733	58075	53100	45430	47614
India	34269	38034	23863	18269	16726
Brazil	27415	34801	31085	59501	72580
Sri Lanka	25405	19088	7876	13312	12648
<b>Major Importers</b>					
World	390184	413158	391191	422333	425197
US	68987	80357	75178	78287	74923
Germany	25978	29239	29452	32630	30765
India	23068	21460	23484	30431	26009
Netherlands	15863	13630	12450	13063	14219
Singapore	27005	20177	6452	5583	5782

Source: FAO



# PEPPER

## FUNDAMENTALS

PEPPER FUNDAMENTALS (TONNES)					
	2015-16	2016-17	2017-18	2018-19	2019-20 E
<b>Indian Scenario</b>					
Production	72,555	62080	64000	62144	48000
Import	19,365	20265	29650	24950	10990
Export	28100	17600	16840	13540	16250
Consumption	50000	55000	58000	58000	57000

	2014-15	2015-16	2016-17	2017-18	2018-19 E
<b>Major Producing States</b>					
Karnataka	30000	22000	31000	35000	21000
Kerala	35000	21000	20000	22000	17000
Tamil Nadu	3000	1500	2000	2000	3000
Total (includes others)	70000	48500	57000	64000	48000

Note: E - Estimated  
Source: Spices Board of India, Trade Estimates

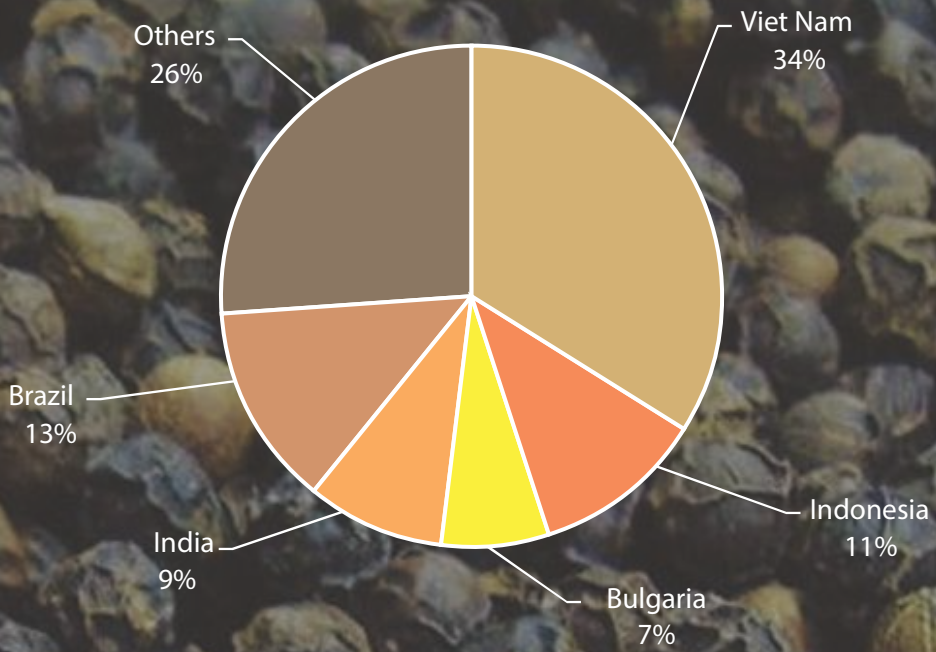
Country	2014-15	2015-16	2016-17	2017-18	2018-19
<b>Major Export Destinations for India</b>					
USA	9684	10740	8128	6376	5465
UK	2098	2161	1868	2250	1375
Germany	1585	2505	972	917	775
Sweden	321	650	1034	834	737
Netherlands	1202	1566	264	372	258
Total (Incl Others)	21450	28100	17600	16840	13540

Source: Spices Board of India



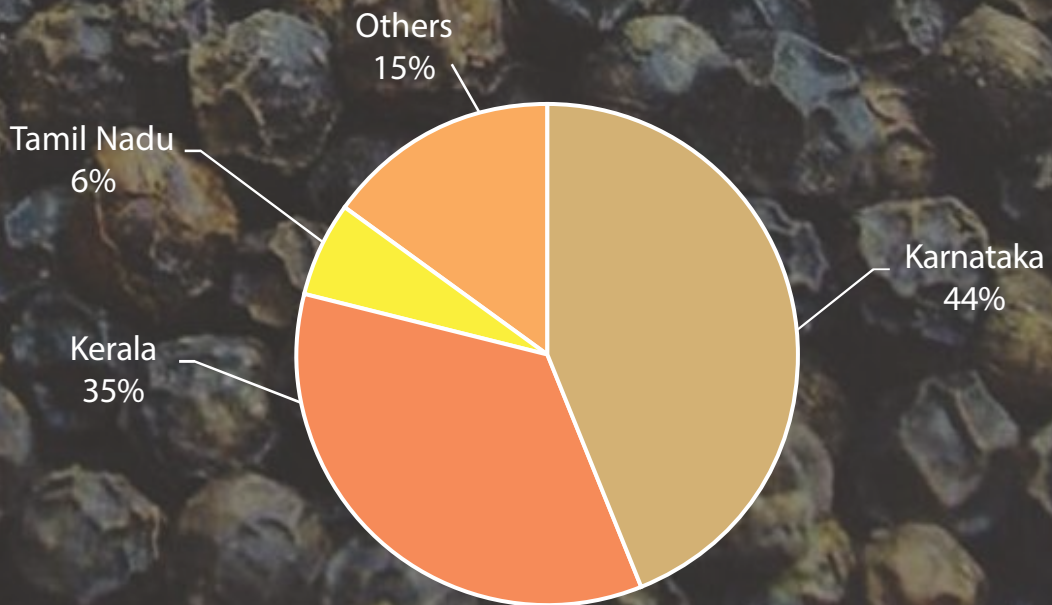


### World Pepper Production 2018



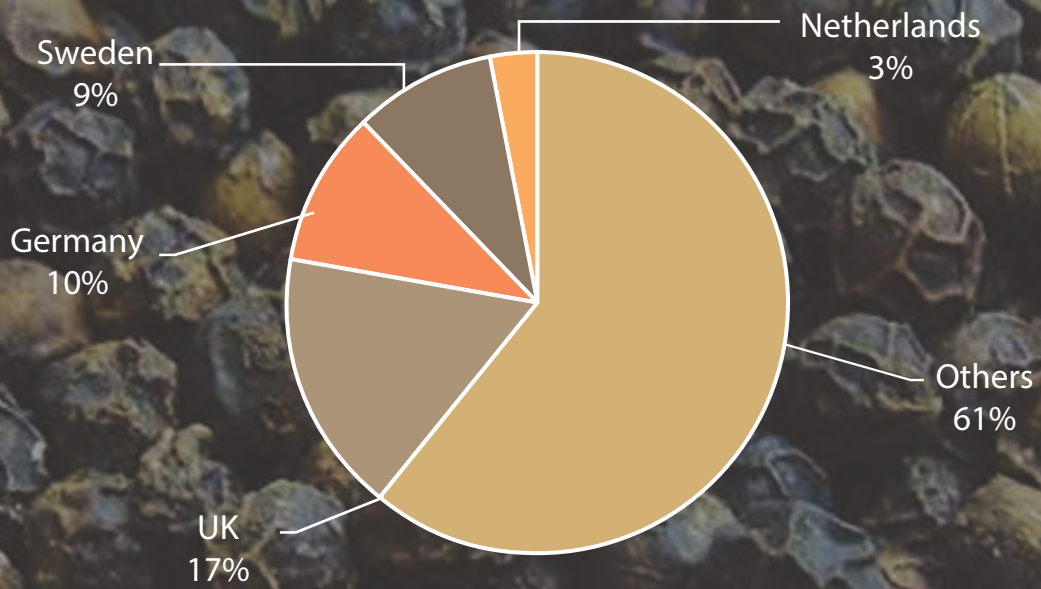
Source: Food and Agricultural Organisation (FAO)

### Pepper Production India 2018-19



Source: Spices Board of India, Trade Estimates

### Pepper Exports Destinations for India 2018-19



Source: Spices Board of India



**NiSM** NATIONAL INSTITUTE OF  
SECURITIES MARKETS  
An Educational Initiative of SEBI

**National Institute of Securities Markets (NISM)**

Plot No. IS 1 & IS 2, Patalganga Industrial Area,  
Village Mohopada (Wasambe), Rasayani, District Raigad, Maharashtra – 410 222  
Tel. No. 91-2192-668300 | [www.nism.ac.in](http://www.nism.ac.in)



**MCX INVESTOR PROTECTION FUND**

**Multi Commodity Exchange of India Limited**

Exchange Square, Suren Road, Chakala, Andheri east, Mumbai - 400 093  
Tel. No.: 91-22-6731 8888, CIN: L51909MH2002PLC135594, [info@mcxindia.com](mailto:info@mcxindia.com), [www.mcxindia.com](http://www.mcxindia.com)

Electronic copy of the yearbook is available at:

<https://www.mcxindia.com/education-training/publications/commodity-insights-yearbook>

Please give your feedback at [research@mcxindia.com](mailto:research@mcxindia.com)

Issued in Public Interest by NISM and MCX Investor Protection Fund  
Read the Risk Disclosure Document (RDD) carefully before transacting in commodity futures and options