

# INTERNATIONAL JOURNAL OF INFORMATION SCIENCE

Patron

Sh. Sanjay Goyal (Adv.)

Editor in Chief

Dr. Parminder Kaur



**S.S.D GIRLS COLLEGE  
BATHINDA, PUNJAB  
(INDIA)**



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# 1. IMPACT OF GST ON MSME'S

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## Abstract

The purpose of this study is to understand the implications of the recently introduced (July 2017) GST (Goods and Services Tax) in India on the MSME (Micro, Small and Medium Enterprises) sector. The study provides a multi-dimensional understanding of the gaps between the effect of the prior GST tax structure and existing GST regime for the MSME'S and the associated tax compliance. Manufacturing sector is an important driver of growth for the Indian economy. The contribution of MSME's in Indian manufacturing sector can be heavily felt in the nation's economy both in terms of volume of production and its contribution to GDP growth. . This paper aims to study the impact of GST on MSME's and their positive and negative impact on them.

**Keywords: - GST, MSME, impact, compliance**

## Introduction

On July 1, 2019, The Goods and service tax completed two year. The Modi Government introduced it to replace various Indirect taxes that existed at that time. It is a value-added Tax levied on goods and services sold for domestic Consumption. On bringing GST into practice, there would be amalgamation of central and state taxes into a single tax payment. Main object of our study is to find out impact of GST on small and Medium Enterprises.

**How will GST help small and medium enterprises?** GST means brings every indirect form of tax under one roof. Before GST various taxes paid by small traders to different departments. **MSME Sector** of the Indian Market considered as the Chief development driver of the Indian Economy. The impact of GST on MSME has been very tremendous. With the implementation of GST, MSME's do not have to files taxes manually to different departments they easily pay them all online. Without GST MSME's faced molestation from the various departments they had to report to file their taxes.

## Salient Features

GST is destination based Consumption tax. It combines various Indirect taxes such as entertainment tax, sales tax, excise duty etc. It allows full tax credit from inputs which can be set off against GST output liability. Another features of GST it eliminate the cascading effect of various state and central taxes.

## Positive impact of GST on MSMEs

(1)*Ease of starting Business*: - Before introduction of GST, every business was required to obtain different VAT registration for different states. There was a different tax rule in different states which increase the complications and Incur a high procedural fees. GST Brings centralised registration that will make easier to start business.

(2)*Reduction of tax burden on new business:* - Before GST Business with a turnover more than rupees 5 Lacs need to pay a VAT Registration Fee. But Now Government increases the exemption limit under GST. This provides relief to over 60% of small traders

(3)*Benefit of Composition Scheme:* - GST Council provides for Composition scheme for small & medium Business. If business has turnover less than 1.5 crore they can opt for composition scheme. Under this scheme they pay tax at flat rate which range between 1-5%

(4)*Benefit of ITC will add value of small Business:* - Before GST there was huge Cascading effect. Cascading effect means "Tax on Tax" Which leads to higher costs and business model become uncompetitive. The big benefit of GST is that it is value added tax.

(5)*Need of distinction between goods & services be eliminated:* - Previously businesses had to calculate VAT, excise duty for levying tax on goods and service tax on services individually, but now all taxes have been merged so there is no need of distinction between goods and services?

(6) *Lower logistical overheads:* - GST by removing time consuming tax procedure encourages the supply of goods across borders. This leads to decrease the logistical cost of companies which manufacture bulky goods.

(7) *Helps MSME's dealing in goods and services:* - GST doesn't make distinction between goods and services this makes taxation system simple for MSME's who deals in goods & services both.

(8)*Inter-state trade:* - Before introduction of GST, MSME's were not engaged in inter-state trade as it carries more taxes which makes products costlier due to which customer base of MSME's shrink. But now under GST tax Credit can be easily transferred irrespective of location of buyer and seller.

(9) *Beneficial for manufacturing sector:* - with introduction of GST Manufactures gets benefit of ITC which reduce their burden of tax. Moreover, end users only pay tax which is charged by last dealer only.

### **Negative Impact of GST on MSME's**

(1)*Reduce threshold limit:* - Under excise tax laws no tax was paid by manufacturer if Gross turnover limit was less than 1.50 crore. Now under GST there are two thresholds exemption limits 40 and 20 lakhs for registration and payment of GST. Businesses can opt up and opt down depending upon their turnover.

(2)*Costly:* - Under GST MSME's are required to pay various returns monthly or quarterly Basis which becomes costliest for MSME's.

(3)*Huge investment in technology:* - Now MSME's are required to maintain all their transactions electronically. Returns are also required to file online which needs huge investment in computers and software.

(4)*Selective Tax levying:* - GST is not levied on alcoholic and petroleum product which is against the policy of "Unified Market" ideology.

(5)*Multiple registrations for different states:* - Under GST Business has to get different GST number if they operate their Business in more than one state. For MSME's this is an unnecessary burden which cause distraction in their productive work.

(6)*Difficulty in filling returns on monthly basis:* - Under GST around 36 returns are required to be filled in a fiscal year. Under GST, Businessmen have to file monthly return on 21<sup>st</sup> day of next month. Because of this business men's remain busy in filling returns instead of giving their time to important activities.

**Recent fraud under GST:-**In Ambala city recently five traders issued fake bills of Rs 45 crore and claim wrong ITC amounting 6 crore within 3-6 months. They people get their firms register with fake documents having no physical existence. It was found that firms did trading ad issued "sale bill and e-way" bills amounting to approximate 45.18 crore to traders within and outside Haryana and paid no tax.

## CONCLUSION

There was a strong need to integrate India into one economy and remove the burden of the multiple taxes and their cascading effect. Introduction of GST simplifies the indirect tax system in the country and ensures seamless business transactions across different states and countries. On the arrival of GST, the MSME sector modified their strategies, systems, supply chains and costing along with maintaining the quality standards as per international norms. Complying with GST is bit complex for MSME's at present. But in long run the effect of GST on macroeconomic is likely to be very positive in the medium term. Inflation would be reduced as cascading effect of taxes would be abolished. Fiscal deficit also remain under the checks. Moreover exports would definitely be increase, FDI would also increase

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## 2. THE BLOCKCHAIN REVOLUTION

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***Abstract** -Blockchain, most of us knew that as the backbone technology behind Bitcoin. The blockchain is a chain of blocks which contain specific information (database), but in a secure and genuine way that is grouped together in a network (peer-to-peer). In other words, blockchain is a combination of computers linked to each other instead of a central server, meaning that the whole network is decentralized. The paper highlights the Blockchain architecture, its types and use in different fields.*

**Keywords:** Introduction, Features, Key Characteristics, Types of Blockchain Network and Uses of Blockchain

### INTRODUCTION

“A Blockchain is a digital, immutable, distributed ledger that chronologically records transactions in near real time. The prerequisite for each subsequent transaction to be added to the ledger is the respective consensus of the network participants, thereby creating a continuous mechanism of control regarding manipulation, errors, and data quality.” The first **blockchain** was conceptualized by a person known as Satoshi Nakamoto in 2008. There are many benefits of blockchain derived from using the technology like transparency, immutability, redundancy and security. In 2018, new blockchain initiatives are launched every day.

### Blockchain and its features:

Companies in multiple industries are exploring and experimenting new ways to:

- Execute transactions quicker for an enhanced customer service,
- Ensure cost efficiency in its operations and
- Assure transparency to customers and regulators.

### Key Characteristics of Blockchain Architecture

- **Cryptography** - blockchain transactions are validated and trustworthy due to the complex computations and cryptographic proof among involved parties
- **Immutability** - any records made in a blockchain cannot be changed or deleted
- **Provenance** - refers to the fact that it is possible to track the origin of every transaction inside the blockchain ledger
- **Decentralization** - each member of the blockchain structure has access to the whole distributed database. As opposed to the central-based system, consensus algorithm allows for control of the network

- **Anonymity**- each blockchain network participant has a generated address, not user identity. This keeps users' anonymity, especially in a public blockchain structure
- **Transparency** - the blockchain system cannot be corrupted. This is very unlikely to happen, as it requires huge computing power to overwrite the blockchain network completely

### Types of blockchain networks

All blockchain structures fall into following categories:

#### Public blockchain architecture

A public blockchain architecture means that the data and access to the system is available to anyone who is willing to participate (e.g. Bitcoin, Ethereum, and Litecoin blockchain systems are public). Drawbacks might include substantial computational power required, little or no privacy for transactions and weak security.

#### Private Blockchain architecture

As opposed to public blockchain architecture, the private system is controlled only by users from a specific organization or authorized users who have an invitation for participation. This can significantly boost trust and confidence between participants. A private blockchain can be run behind a corporate firewall and even be hosted on premises.

#### Permissioned blockchain networks

Businesses that set up a private blockchain will generally set up a permissioned blockchain network. It is important to note that public blockchain networks can also be a permissioned. This places restrictions on who is allowed to participate in the network, and only in certain transactions. Participants need to obtain an invitation or *permission* to join.

#### Consortium blockchain architecture

Multiple organizations can share the responsibilities of maintaining a blockchain. These pre-selected organizations determine who may submit transactions or access the data. A consortium blockchain is ideal for business when all participants need to be permissioned and have a shared responsibility for the blockchain.

### Blockchain architecture can serve the following purposes for organizations and enterprises:

- **Cost reduction** - lots of money is spent on sustaining centrally held databases (e.g. banks) by keeping data current secure from cyber crimes and other corrupt intentions.
- **History of data** - within a blockchain structure, it is possible to check the history of any transaction at any moment in time.
- **Data validity & security** - once entered, the data is hard to tamper with due to the blockchain's nature. It takes time to proceed with record validation, since the process occurs in each independent network rather than via compound processing power. This means that the system sacrifices performance speed, but instead guarantees high data security and validity.

### Core Components of Blockchain Architecture:

- **Node** - user or computer within the blockchain architecture.
- **Transaction** - smallest building block of a blockchain system (records, information, etc.).
- **Block** - a data structure used for keeping a set of transactions which is distributed to all nodes in the network
- **Chain** - a sequence of blocks in a specific order
- **Miners** - specific nodes which perform the block verification process before adding anything to the blockchain structure
- **Consensus (consensus protocol)** - a set of rules and arrangements to carry out blockchain operations

## Uses of blockchains

### Government

A number of governments have expressed an interest in blockchain technology to store public records on a decentralized data management framework. People use government applications such as education, public records and voting.

### Waste Management

In Walton's blockchain project, Walton chain's RFID technology is being used by a Smart Waste Management System, China will enable supervision of waste levels to improve operational efficiencies and optimize resources.

### Border Control

Essential has been meeting with the Dutch government to create a new system for vetting passengers traveling between Amsterdam and London. This system is for the checking of passengers at multiple points, Block chain provide solution of ensuring that the data has not been tampered with and is verifiably accurate.

### Healthcare

Healthcare projects such as MedRec are using the blockchain as a means of facilitating data sharing while providing authentication and maintaining confidentiality.

### Medical

Medical centers are a prime target for hackers, as evidenced by the ransomware attacks that struck NHS hospitals in the UK. There are currently more than 50 different electronic healthcare record (eHR) software systems that operate in different hospitals. The Essential framework addresses all these issues by using a blockchain-powered system that will store clinically relevant patient data. Patient privacy is maintained on a secure decentralized network where access is granted to only those who are medically authorized and only for the duration needed.

### Real Estate

Ukraine holds the honor of becoming the first nation to use blockchain to facilitate a property deal. The deal was enabled with the aid of smart contracts on the Ethereum blockchain, and is intended to be the first of many completed by Propy, a startup specializing in blockchain-based real estate deals.

### Tourism

Blockchain is being researched as a means of improving Hawaii's economy by giving tourists an opportunity to pay for local goods and services with bitcoin and other currencies. This way the state's

government hopes to attract tourists, especially from Asia, to spend more money and eventually help Hawaii to develop economically.

### **National Security**

In 2016, the US Department of Homeland Security (DHS) announced a project that would use blockchain as a means of securely storing and transmitting the data it captures. Using the Factom blockchain, data retrieved from security cameras and other sensors are encrypted and stored, using blockchain as a means of mitigating the risk of data breaches. The project is still ongoing.

### **Taxation**

As one of the world's most technologically advanced countries, it's no surprise China has become one of the first and most prominent adopters of blockchain and everything it offers. It has decided to use the technology to facilitate taxation and electronic invoice issuance in a project headed by Miaocai Network in conjunction with the State Administration of Taxation.

### **Mobile Payments**

Cryptocurrencies with its underlying blockchain technology is being used to facilitate mobile payments in a wide range of projects. One of the latest initiatives announced, scheduled to launch in the fall of 2018, will involve a consortium of Japanese banks. They'll be using Ripple's technology to enable instant mobile payments.

### **Land Registry**

Blockchain once again proves that it's not just applicable in the crypto space and by small companies. The government of Georgia uses it to register land titles. They have created a custom-designed blockchain system and integrated it into the digital records system of the National Agency of Public Registry (NAPR). Georgia is now taking advantage of the transparency and fraud reduction offered by blockchain technology.

### **Computation**

Amazon Web Services have collaborated with Digital Currency Group (DCG) to improve their database security with the help of blockchain. They will provide a platform for DCG's startups to work, as well as technical support for their projects.

### **Journalism**

Permanence is now a hot topic in the journalism trade. One wrong move and years of hard work with research could go down the drain. Blockchain is one smart solution to the problem. Civil, a decentralized journalism marketplace, apart from obvious blockchain benefits, offers an economic incentive model for quality news content, coupled with the ability to permanently archive content, which will remain accessible at any time in perpetuity.

### **Railways**

In Russia, rail operator Novotrans is using blockchain technology with a goal to improve the speed of its operations. The company, which is one of the largest rolling stock operators in the country, will be using blockchain to record data pertaining to repair requests, inventory and other matters pertaining to their operations. The idea is that the blockchain records will be more resistant to tampering and data corruption.

### **Conclusion:**

Although there are many drawbacks of blockchain like it is very difficult to modify data once the data has been added to blockchain. Other than this is if a user loses their private key, the money is effectively lost, and there is nothing they can do about it. There is also a storage problem also due to the increasing

network of blockchain. There are some drawbacks but the benefits are more than that. Data is often stored in thousands of devices on a distributed network of nodes, the system and the data are highly resistant to technical failures and malicious attacks. Once the data is added to blockchain, it is extremely difficult to remove or change it. In this way it provides full security to data. As there is no an intermediary, a blockchain system negates the risk of trusting a single organization and also reduces the overall costs and transactions fees by cutting out intermediaries and third parties.

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### 3. “MAYA Numbers” A different concept of Mathematics

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**Abstract:** Mathematics has played a significant role in the development of culture from millennia.

A research has shown that people who perform mental calculations are able to think fast and arrive at right decision after analyzing different situations and different methods much quicker than those who are dependent on computers and calculators for their mental work. Mathematical ideas are generated by different tools like Abacus, Vedic math or Maya numbers etc. Mathematical ideas that originated in different culture have had a profound impact on the world. Math was a part of the Mayan culture with their numbers existing as far back as the 400AD. The Mayan's math was logical and ahead of its time. Their number system was similar to ours in that they had place value, but different in that they wrote their numbers vertically instead of horizontally. Where we use ten symbols, they only used three to represent all numbers. They used a stone or dot to represent one, a bar or stick to represent five, and a shell to represent zero. Using just these three symbols they were able to write very large numbers and do simple arithmetic. Roman Numerals used hundreds of symbols to represent numbers while the Mayans could represent the same numbers in three symbols. In this paper I discuss different aspects of Maya numbers, their history, and basic concept, how they work & comparison with different number system.

**Keywords:** Culture, Maya math, Symbols, Roman numbers, Place value.

**Introduction:** The modern system of numbers is called the Hindu Arabic system because it was probably invented in India and came to western world by way of Arabia. Maya people live in southern Mexico and the Central American countries of Guatemala. Ancient Maya culture flourished in this area between 1000 B.C. and 1000 A.D. The ruins of many ancient Maya cities have been found in this area. These cities contain pyramids, temples, palaces, ball courts and roads etc. Maya were great builders. They made many large and complex buildings and monuments. They were good astronomers also. They were using large numbers in their calculations. Obviously they needed a good and efficient number system. As they say, need is the mother of inventions. They developed a vigesimal numerical system base value 20 which has very advanced features, such as the positional system with zero as a place value.

**Maya numbers:** The Maya culture of Central America invented an advanced, base-20, place value based number system, using a symbol for zero, almost at the same time as our, base-10, 'Hindu-Arabic' numerals were invented in India. This describes the Maya number system and places it in the historical context of the development of other number systems around the world. The basic difficulty in it was its arithmetic operations.

Maya number system is far more efficient than the Roman numerals, which were being used at about the same time. The Roman numerals used symbols, I, V, X, L, M, etc whose values are not based on place values. Even our Hindu-Arabic number system uses ten symbols 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9 whose shapes do not follow any logic or rules. Maya numbers are elegantly made of only three symbols and are written according to a place value based system like ours

**Objective of paper:** Advantages of Maya Math just like

1. Only 3 symbols
2. Single digits (1 to 19) have logical shapes, easy to remember

- 3. Single digit addition and subtraction
- 4. Counted on fingers and toes
- 5. Shell or eye shaped zero
- 6. Numbers less than 20 are written in a base 5, additive system
- 7. Numbers equal or greater than 20 are written vertically, using places with increasing powers of 20.
- 8. Would save time in primary school as it use less symbol

3 basic symbols:

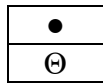
Dot (•) = 1, Bar (—) = 5, Eye (⊖) = zero

Numbers 1-19 are additive:

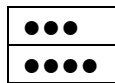
0	1	2	3	4
⊖	•	••	•••	••••
5	6	7	8	9
—	• —	•• —	••• —	•••• —
10	11	12	13	14
==	• — —	•• — —	••• — —	•••• — —
15	16	17	18	19
— — —	• — — —	•• — — —	••• — — —	•••• — — —

20 onwards place-value based system operates. The bottom place is units (200), next up 20s (201), the next up 400s (202), the next up 8000s (203), and so on. Examples:

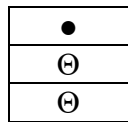
(1) 20                                      20s:    1x20 +    0x1



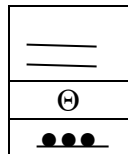
(2) 64                                      3x20 +    4x1



(3) 400                                     1x400 +    0x20 +    0x1

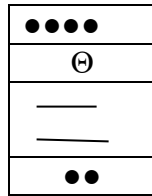
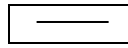


(4) 4,013;                                10x400 +    0x20 +    13x1



(5) 32,202 8000s:

$$4 \times 8000 + 0 \times 400 + 10 \times 20 + \dots + 2 \times 1$$



**Algebra of Maya numbers:** Maya numbers can be added, subtracted, multiplied and divided using algorithms very similar to our base-10 math. -Ideas of ‘Carry over’ and ‘borrow’ are same as ours.  
**1 ADDITION:** The addition is striking simple. In figures we show the operation of addition take place. We make the addition grouping points and bars on each level and transforming bars into points as shown. For every two bars, we put a point in the superior immediate level. In this way the result can be found. For adding several numbers the procedure is the same. The addition of many numbers can be done very quickly.

For Example

a)

	+		=	
--	---	--	---	--

**224 + 150 = 374**

<b>224</b>		<b>150</b>		<b>374</b>
	+		=	

b) **312 + 7908 = 8220**

	<b>312</b>	+	<b>7908</b>	=	<b>8220</b>
<b>8000</b>	⊖		⊖		
<b>400</b>	⊖				⊖
<b>20</b>					
<b>1</b>					⊖



	—				
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**3 SUBTRACTION** For the subtraction, one point annihilates one point and one bar annihilates one bar. This is done for each level, starting from the lowest one. For example subtraction 862-643. Notice that in figure the number 862 is on the column of the left and the number 643 is on the right. We work on the minuend without altering the subtrahend. In order to have enough dots to be annihilated on the lowest level, we start by passing one dot to this level, taking it from the second level. This dot transforms into two bars, as it is seen in figure. Furthermore, we replace bars by dots, as we do in figure .The dots and bars locked up in are eliminated. We can read the result in the column and is 219. The test is straightforward. We simply add the numbers .and we obtain the minuend.

	862	-	643	=	219
400	••		•		
20	•••		•• —		—
1	••		•••		•••• — — —

**Multiple subtractions** One clear advantage of this method of subtraction is the fast and easy way to perform multiple subtractions. The rules are the same as above. Let us consider the subtraction 9845 - 1211- 5021 - 2502. We put the largest of these numbers the minuend on the first column of the left. However, we can place it on any column. We can place the other numbers the subtrahends on the columns of our choice. Then, we work on the minuend without altering the subtrahends. We annihilate on the largest number and on each level the corresponding dots and bars of the other numbers. We can read the result on the same column where he had placed the largest number. The result is 1111. Notice that adding all the numbers again, we obtain the test of the subtraction. We obtain 9845, as we should.

**4 MULTIPLICATION** To perform the multiplication, we do not need tables. Let us make the product 215X12. We put the factors outside the board; one (215), vertically and the other horizontally, like we show in figure. We are going to reproduce in each square the figure which we have to the left by outside the board, so many times as the number of the superior part indicates. Clearly, we can perform the reciprocal operation too. We do the easier of these two possibilities. In this manner, in the first square of the left column we put one pair of dots, or twice a dot. In this way, we solve the squares of the first column of the left. We solve the squares of the following columns in a similar fashion. We have almost finished the multiplication. Then, we start the final part to obtain the product. We group diagonally. Each diagonal corresponds to a power of 10. Afterwards, we use the rules of which each group of five dots is transformed into a bar and that every two bars become a dot in the superior immediate level, leaving a zero in its place. After doing this, we read the result directly along the diagonal. The square of the right inferior corner corresponds to the units.

**5 DIVISION:** This is the inverse operation of the multiplication, and thus we will solve it. The dividend is conceived like the product of two numbers, one of them is the divisor and the other, unknown, is the quotient. In this way, the dividend is placed on the diagonal of the board. Let us consider  $180 \div 12$ . We will put the divisor in a vertical form and by outside of the board. The quotient will be in a horizontal form and by outside of the board too. These positions can be exchanged with no problem. We begin the division

by trying to find the number that we have to put in the external part, by above of the square of the left corner, so that, reproducing the first figure external to the left as many times as the number that we are looking for, we obtain the dot of the left superior square of the board. Thus we are following an inverse way from the multiplication. We find that we have to put one dot. With this we satisfy the first square of the first column. In order to complete the inferior immediate square of the same column we see that we need two points. We take those two points from the number that is in the diagonal. In this way, we have completed satisfactorily the first column. Now, we work with the second column. We must find the following number of the quotient that goes in the external part of the board by above of the second column. If we use a number six we complete the first square of this column, but we exceed what we have in the inferior square of this column. In this way, we try a solution by using one bar. In the first square of the second column, the dot is in excess, thus we lower it to the inferior immediate square like two bars. We ignore the seashell that corresponds to the zero. These two bars are exactly what we need in the last square. Thus the division has concluded and is exact:  $180 \div 12 = 15$ .

**6 SQUARE ROOT:** To find the solution of the square root, we consider it like a division. The radicand is the dividend. Of course that we do not know the divisor or the quotient, but we know that they are the same, and we use this fact to find the solution. Let us find the square root of 144. As we are considering it as a division, we place the radicand on the diagonal of the board, as we show in figure 31. We proceed like we do in the division, but knowing that the quotient must be equal to the divisor. In order to have one dot in the square of the left corner of the board, we need one dot like first number of the divisor and of the quotient. After finding the solution for the first square, we follow an additional rule for the square root. We have to distribute symmetrically as possible, the number of the radicand located on the following inferior level. This distribution is performed among the squares located along the diagonal that corresponds to the same power of 10. Now we proceed to find the following number of the solution. We may try with a pair of dots in the external superior part of the second column and simultaneously, in the external part of the second row of the board. We see that with this trial of the pair of dots, we require to have a pair of dots on the first square of the second column, which we do. We also require having two dots on the first square of the second row, which we do. Finally, we need to solve the second square of the second column. In this square, we have four dots. These four dots correspond to two pairs, which are what we need according to our trial of a pair of dots. In this manner, the square root is solved. The result is exact and is 12.

**Conclusion:** In my conclusion I want to state that today is the world of competition and fast speed. Many long words take short shapes on social media. Same in field of mathematics many option are available. But I think Maya numbers and its arithmetic also plays a very important role. For small kids it is easy to understand and just a fun of line for learn about addition, subtraction and division etc. We must follow recommend it at school level.

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## 4. AN OVERVIEW ON THE SYNTHESIS OF METAL NANOPARTICLES

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**Abstract** - Nanomaterials are in extreme demand due to their unusual properties since last few years. The present article gives an introductory overview about the nanoparticles especially metal nanoparticles, their properties and synthesis methods due to their excellent surface plasmon resonance (SPR) property that directs them towards the biomedical applications. The usage of nanoparticles is well known in the field of cosmetics and pharmaceuticals products, information storage, fuel cell, semiconductors, catalyst and sensors. A summary on the different type of synthesis methods used for metallic nanoparticles has been given.

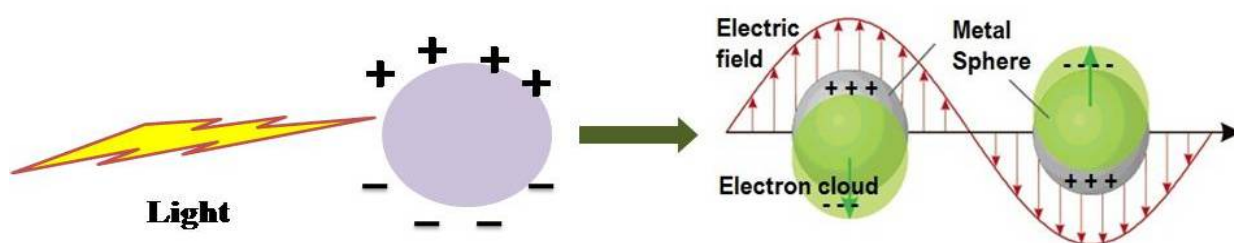
**Introduction** - Nanoscience and nanotechnology refers to the branch of science which deals with the synthesis, characterization, exploration, and exploitation of nanostructured materials. The interesting phenomena occurring at the nanometer scale motivate the physicists, chemists, and engineers for research in nanotechnology for futuristic nano devices [1, 2]. “Nano” means small, very small, and is very special. When the dimension of a material is reduced from a large size, at first the properties remain the same, and then small changes occur, until finally dramatic changes in properties can occur when the size drops below 100 nm. This phenomenon is in association with the quantum effect and large surface area to volume ratio experienced at these dimensions. Also due to significantly small size, the physical properties are dominated by quantum mechanics instead of the classical mechanics [3]. Therefore, the properties of the nanomaterials become size-dependent as the continuous transitions between the electronic bands become discrete. Further the properties like electrical conductivity, optical property, color, strength of the particle, which are dependent on size and shape of the particles show drastic differences from their macroscopic counterpart. As the size of the particle changes to the nanometer regime, the range of applications of nanomaterials can be extended. Noble metals and semiconductors nanoparticles are unique examples of this principle. For example, bulk silver is nontoxic whereas silver nanoparticles (AgNPs) can kill bacteria during contact. The other extraordinary property of nanomaterials is that they can be fabricated atom-by-atom using bottom-up technique. The fabrication process uses the information embedded in the material building blocks; to assemble themselves in the final product. While the properties of nanoparticles are different from that of their bulk sample of the same material, group of nanoparticles may also have combined properties that are different to those exhibited by individual nanoparticle and bulk samples. These properties have potential applications in diverse areas such as Nano electronics, sensors, single electron transistors etc. [4,5]. The little modifications in the size, shape and composition can manipulate the optical, mechanical, electrical, magnetic and chemical properties of the nanoscale materials. Nanoscale materials have been the centre of attraction these days as these are concerned for addressing some basic problems of the quantum size effect by limiting the number of free electrons as well as their possible applications as advanced materials [6, 7]. The applications of

nanoparticles are well known in the field of cosmetics and pharmaceuticals products, information storage, fuel cell, semiconductors, catalyst and sensors [8 - 10]. Among all the nanoparticles, research on the metal nanoparticles has recently become the focus of attraction due to their unusual properties.

**Metal Nanoparticles** - Metal nanoparticles are fascinating nanoscale materials with an ease of synthesis and modification. The superiority of metal nanoparticles than other materials contain their strong optical and electronic properties [11, 12]. These properties depend mostly on the composition, shape and size of the nanoparticles [13]. Metal nanoparticles possesses confined electronic configuration and this property can be exploited as conducting elements in the production of nano-devices (e.g. single-electron tunnel diodes). Nanoparticles made from noble metals particularly gold (Au), platinum (Pt), silver (Ag), palladium (Pd) and copper (Cu) are the most extensively studied nanoparticles these days. Cu nanoparticles are easy to synthesize using wet chemical method and hence studied thoroughly in the last few years [14]. Cu nanoparticles have attractive optical and catalytic properties at room temperature and hence find applications in biomedicine, optical imaging, and in catalysis. Pt and Pd nanoparticles are also explored due to their catalytic activity. These can be easily synthesized using photo-catalytic reduction and wet chemical reduction methods. Pd-coated nanoparticles are used in many industrial reactions for carbon bond formation as catalysts [15]. Pd nanoparticles are employed as membrane to filter hydrogen in some fuel processing applications as Pd is an outstanding hydrogen absorber. Nanoparticles of Ni are also exciting as these play major role in catalysis and magnetic storage [16]. AgNPs can be synthesized in aqueous solution by reducing Ag metal salt [17]. These exhibit better antimicrobial activity and hence useful in day to day life such as used as filtration in some water purification system [18].

The optical properties of metal nanoparticles depend primarily on surface plasmon resonance (SPR). SPR is the collective oscillation of the free electrons in the metal nanoparticles. It is outstanding that the line width and SPR peak depend on the size, shape of the nanoparticle and the environment in which the particles are there.

**Surface Plasmon Resonance** - Most of the metals especially noble metals like Au, Ag and Cu are considered as free electron systems. These types of metals contain equal number of conduction as well as valance electrons. When the electromagnetic wave interacts, the conduction electrons start oscillating at resonant frequency under the electric field. The collective oscillation of conduction electrons is termed as plasmons. As only the electrons at the surface are more prominent, so are referred as surface plasmons. When the frequency of the light hitting the metal matches the resonant frequency of the surface plasmons, the surface plasmons begin to resonate and are called as SPR. For the resonance to occur, the size of the particle must be less than that of wavelength of incident light. Figure 1.1 represents the interaction of light with the electrons of metal particles.



**Fig. 1.1.** A schematic representation of surface plasmon resonance in metal nanoparticles.

When electric field is applied, movements of electrons completely rely on the band gap of the material. In metals, both the valence and the conduction band overlap with each other and only the excited electron will contribute. The excitation of electrons from valence band to conduction band takes place when the surface of the metal absorbs the wavelength of incoming light. Metals show plasmon effect as they have excessive density of free electrons. The number of factors such as size, shape, dielectric constant and refractive index of the medium contribute towards the sensitivity of the plasmons. In metal nanoparticles, local field effect around the particles create changes in their dielectric function and give rise to surface polarization [19]. SPR of the metal nanoparticles can be easily optimized throughout the visible and near-infrared region with modification in their size, shape and dielectric medium.

**Synthesis of Metal Nanoparticles** - Researchers are constantly doing efforts to find cheap, convenient and eco-friendly safe methods for production of the nanoparticles. The synthesis of metal nanoparticles can be categorized in two ways. In the first one, size of the material is reduced significantly using physical or chemical methods and is known as top down approach [20]. The size, shape and surface structure of the resulting particles completely depends upon the technique that has been used. The reduction in size has a tendency to introduce surface imperfections, which strongly affects the overall physicochemical properties of the formulated nanoparticles. The second one, prepare nanoparticles via the assembly of atoms, molecules and smaller particles and termed as bottom up approach [21, 22]. A variety of preparation methods have been reported for the synthesis of metal nanoparticles[12]. The different routes for the synthesis are briefly described below:

**Chemical Reduction Method** – In this method, metals salts are reduced chemically in solutions using appropriate reducing agents to obtain metal nanoparticles. The commonly used reducing agents are sodium borohydride, ascorbic acid, hydrazine and formaldehyde etc. In 1951, Turkevich reported the synthesis of spherical AuNPs for the first time. In this method, metal nanospheres were synthesized by reducing salt of Au using citrate as reducing agent in water. Throughout the process, temperature, order of addition of the various reagents and the ratio of metal precursor to reducing agent has a significant role in the size determination of AuNPs[23].

**Electrochemical Deposition Method** - Electrochemical deposition method has been extensively used to synthesize metal nanoparticles, employing a metal anode and a metal or glassy carbon cathode in the form of electrochemical cell [24]. Organic solutions of tetra alkyl ammonium halogenides are taken as the electrolytes which also act as stabilizers for the synthesized metal nanoparticles. When electric field is applied, anode form metal ions by going through oxidative dissolution, migrates towards the cathode. The metal ions are reduced by ammonium ions which lead to nucleation and succeeding growth of metallic nanoparticles in the solution. Nanoparticles of Ni, Co and Pd of size having range 2 to 5 nm can be formed by using this method. Electrochemical-metal deposition is an appropriate and fast method for organizing metal nanoparticles on large areas of conductive substrates.

**Radiolytic Method** – To synthesize metal nanoparticles, gamma radiolysis offers a clean and hygienic method [25]. In this process, radiolytic radicals are produced with the deposition of the gamma radiation energy throughout the solution. Due to highly reactive nature, the produced radicals experience redox

reactions with appropriate molecule/species. A complete reducing environment can be generated in the system for oxidizing radicals with the addition of suitable scavenger. In this reducing environment, metal ion precursors started converting to zero-valent atoms and produces metal nanoparticles. The reduction potential of the radicals generated through water (solvent) is more negative than Au and Ag ions, so these can easily reduce the corresponding ions [25].

**Photochemical reduction** - Metal nanoparticles can also be synthesized in solution or in polymeric films by using photo reduction method. The nanoparticles obtained during photochemical synthesis have wide use in physiological conditions because of the involvement of the biocompatible reducing agents in aqueous medium. Tyrosine is generally used as the photo reducing agent for the synthesis of AuNPs and AgNPs. The reaction is generally carried out in a laboratory reactor system having a UV lamp enclosed by quartz tube for cooling of water [26].

**Wet chemical method** – In the wet chemical method, different shapes of metal nanoparticles can be easily synthesized by template mediated method. Here, a surface active molecule such as acetyltrimethylammonium bromide (CTAB) is generally used along with the seed solution and a mild reducing agent such as ascorbic acid. For example, metal nanorods can be synthesized in two steps: Preparation of seed solution and growth of nanorods[27].

**Inverse Micelles** – Nanoparticles of various sizes and shapes can be generated by this method. Different surfactants are used in this method to build tiny pockets of a water phase in an organic solvent. The head of the surfactant faces the aqueous phase and the tail faces the organic phase. The use of metal salt, associated to the surfactant before the addition of the reducing agent, is the most significant part to generate single crystal, monodisperse nanoparticles. Moreover, various other materials can also be synthesized using this method [28].

**Polyol Reduction Method-** This method provides an excellent approach for controlling the size of metal nanoparticles in solution. The appropriate molar ratio of polymer to metal or metal precursor concentration is important for the production of metal nanoparticles with uniform distribution [29]. The advantage of this method is the one-step synthesis, reproducibility and easy to operate feature.

**Microwave Dielectric Heating Reduction** - In a microwave heating, electromagnetic radiation of high frequency interact with the permanent dipole moment of the molecule. This method is predominantly exploited for the synthesis of both metal and semiconductor nanoparticles since the uniform heating may produce narrow distributed particles [30]. AgNPs have been synthesized in three different solvents, glycerol, ethylene glycol and water using microwave heating technique [31]. In comparison to conventional heating method, this method is extremely fast, shortens the reaction time and provides uniform heating.

**Ultrasonic Irradiation** - Metal nanoparticles are synthesized by ultrasonic irradiation method using an ultrasonic generator, which is operated at 50 kHz with an output power of 100 W or 200 W. The temperature of the reaction system is maintained at 40 °C and varying irradiation time is kept between 3 to 12 hours. The highly concentrated AgNPs are synthesized by ultrasonic irradiation of a heterogeneous solid-liquid system [32].

**Solvothermal Synthesis** - The solvothermal reduction process is economical method and requires only simple precursors. The method is very much sensitive for temperature and pressure. It uses the solvent under reasonable to high pressure (usually between 1 to 10,000 atmosphere) and temperature (usually between 100 °C to 1000 °C) that smoothen the process of interaction of precursors throughout synthesis [33].

Chemical reduction is the regularly used method for the synthesis of noble metal nanoparticles as stable, colloidal dispersions in aqueous or organic solvents. Sodium borohydride, ascorbic acid, trisodium citrate and elemental hydrogen are used as the most common reducing agents. It is reported that small nanoparticles formed with the use of strong reducing agents such as sodium borohydride, however, large sized nanoparticles are obtained with the use of weak reducing agent like ascorbic acid [34, 35]. The use of protective agents influences the stabilization of nanoparticles during the metal nanoparticle synthesis. The mechanism behind the stability of the nanoparticles is that protective agents adsorbed or bind on the surface of the nanoparticles and prevent them from agglomeration [36]. Polymers such as poly-methyl-methacrylate (PMMA), polyvinyl pyrrolidone (PVP), polyethylene glycol (PEG) and poly-methacrylic acid (PMAA) are commonly used for the synthesis of metal nanoparticles [37]. Synthesis of AuNPs and AgNPs are of huge concern to the researchers due to their large area of applications.

**Conclusion: Metal** nanoparticles are fascinating nanoscale materials with an ease of synthesis and modification. The superiority of metal nanoparticles than other materials contains their strong optical and electronic properties. These properties depend on the composition, shape and size of the nanoparticles. The spherical shaped nanoparticles had been synthesized by using chemical reduction method. Control of concentration of the reducing agent has been found to play an important role in defining the size of synthesized nanoparticles.

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## 5. EFFECT OF COOKING TREATMENTS ON ANTINUTRIENTS AND ZINC CONTENT IN RICE CULTIVARS

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**Abstract:** Six recommended rice varieties namely (PR 111, PR 113, PR 116, PR 118, PR 120 and PR 201) commonly grown in Punjab were analyzed in the laboratory. The treatments given to raw grains were soaking, pan cooking, pressure cooking and microwave cooking. Raw and processed grains were analyzed for phytic acid, polyphenol, oxalate, and zinc using standardized methods. Phytic acid ranged from 84 to 95.3 mg with a mean value of 91 mg/100g. The lowest content of phytic acid as 78.7 mg/100g was observed in soaked grains followed by pan cooking as 82.8 mg/100g, pressure cooking as 84.1 mg/100g and microwave cooking as 86.1 mg/100g. PR 120 was found to have highest value for phytic acid whereas PR 201 (soaked and pan cooked), PR 116 (Pressure cooked) and PR 118 (microwave cooked) had the lowest content of phytic acid. Mean value of polyphenols in raw grains of rice cultivars was 211.6 mg/100g which decreased significantly with the cooking methods employed. PR 116 and PR 118 were found to have highest value for polyphenols whereas PR 201 (soaked) and PR 120 (pan, pressure and microwave cooked) had the lowest content of polyphenol. Mean value of oxalates of rice cultivars was 3.30 mg with a range of 2.70 mg to 3.60 mg/100g. Results revealed significant decrease of 5.4 to 13.4% in phytic acid, 13.34 to 26.32% in polyphenols and 6.66 to 29.3% in oxalic acid content with cooking treatments. The significant variation in rice varieties was observed for all anti nutritional factors because of different agronomic and climatic conditions. Average value for total zinc content was found to 1.21 mg/100g respectively in rice varieties. The corresponding values for soaked, pan cooked, pressure cooked and microwave cooked grains were 1.15, 1.22, 1.25 and 1.22 mg/100g. The processing methods significantly reduced the anti-nutrients thereby increasing the availability of minerals in rice cultivars.

### Introduction

Cereal grains are the main source of the energy. Rice is the most important cereal crop for human consumption. Rice considered as third major crop after wheat and cotton in 2007-08 and cultivated on area of 2594 thousand hectares with a production of 5720 thousand ton (Shabbiret *et al* 2008). Rice also has a considerable amount of proteins with excelled spectrum of amino acids. The amino acid profile of the rice shows that it is high in glutamic acid and aspartic acid while lysine is the limiting amino acid. It is the main dietary source of micronutrients like iron, calcium and zinc (Lestiene *et al* 2005a). Diet-related factors in plant foods that affect bioavailability include: the chemical form of the nutrient in food and/or nature of the food matrix; interactions between nutrients and other organic components (e.g. phytate, polyphenols, dietary fibre, oxalic acid, protein, fat, ascorbic acid); pretreatment of food as a result of processing and/or preparation practices (Gibson 2006). According to Lonnerdal (2000) the phytate, which is present in staple foods like cereals, had a strong negative effect on zinc absorption from composite

meals. Cooking is important to make the food safe by killing contaminating bacteria and also to inactivate several heat labile anti nutritional factors present in many foods (Sinha *et al* 2005). Cereals must be cooked before consumption. Food processing not only improves flavor and palatability of foods but also increases the bioavailability of nutrients, by inactivating anti-nutritional factors, growth inhibitors and haemagglutinins (Xu and Chang 2008).

### Materials and methods

Six recommended rice varieties namely (PR 111, PR 113, PR 116, PR 118, PR 120 and PR 201) commonly grown in Punjab were procured from Department of Plant Breeding and Genetics, PAU, Ludhiana. The treatments given to raw grains were soaking, pan cooking, pressure cooking and microwave cooking. 100 g raw rice was taken for each cooking treatment.

1. Soaking: Rice cultivars were cleaned, washed and soaked for 1 hr in tap water. Excess water was decanted and samples were cooked.
2. Covered Pan cooking: Cultivars of rice was cooked in a covered pan using (1:2) rice water ratio for 10-12 minutes.
3. Pressure cooking: Rice cultivars were cooked at 15 lbs. pressure using 1:1 rice water ratio for 5 minutes.
4. Microwave cooking: Procured rice cultivars were cooked in microwave at 2450 mega hertz with 1:2 rice water ratios for 7-10 minutes.

All the raw as well as the processed samples were dried in the oven at  $60\pm 2^{\circ}\text{C}$  and further ground to form powder which was stored in the air tight containers for further analysis. All samples were analyzed in triplicates for chemical analysis.

The raw and processed rice cultivars were analysed for antinutritional factors Phytic acid, Polyphenol and Oxalate were determined by Haug and Lantzsch, 1983; AOAC, 1985 and Abezaet *al.*, 1968 respectively. Zinc was analysed atomic absorption spectrophotometer model. Samples were analysed statistically by 2-way analysis of variance (Cheema and Sidhu 2007).

### Result and discussion

The antinutritional factors phytic acid, polyphenol and oxalic acid of raw rice samples ranged from 84 to 95.33 mg/100g, 198.73 to 223.71 mg/100g and 2.70 to 3.60 mg/100g with mean value of 91, 211.64 and 3.30 mg/100g respectively. Results revealed significant decrease of 5.4 to 13.4% in phytic acid, 13.34 to 26.32% in polyphenols and 6.66 to 29.3% in oxalic acid content with cooking treatments. Soaked samples are found to have the lowest content of antinutrients followed with pressure cooked rice samples. Among varieties of rice samples PR 201, PR 116 and PR 113 had the lowest value for phytic acid, polyphenol and oxalic acid as 76, 152.53 and 1.8 percent respectively. (Table 1, 2 and 3).

The total zinc content of raw rice samples was 1.12 to 1.32 with mean value of 1.21 mg/100g. Whereas soaked, pan cooked, pressure cooked and microwave cooked samples had 1.07 to 1.32, 1.07 to 1.40, 1.12 to 1.37 and 1.12 to 1.35 mg/100g of zinc content with mean value of 1.15, 1.22, 1.25 and 1.22 mg /100g respectively. In comparison to raw rice cultivars, there was a slight increase in zinc content in pan cooked and pressure cooked samples in contrast to slight decline in soaked and microwave cooked samples but the change is non- significant. PR 118 and PR 116 had the lowest and highest value in soaked and pan

cooked samples whereas PR 113 and PR 111, PR 201 and PR 111 had the lowest and highest value in pressure cooked and microwave cooked rice cultivars. (Table 4)

**Table 1: Phytic acid content of raw and cooked rice cultivars. (mg/100g)**

Varieties	Raw	Soaked	Pan cooked	Pressure cooked	Microwave cooked
<b>PR 111</b>	91.3±1.3	78.6±0.6	86.0±1.9	90.6±2.6	82.6±1.3
<b>PR 113</b>	90.6±1.3	76.6±0.6	79.3±0.6	80.0±1.9	89.3±1.3
<b>PR 116</b>	94.0±1.9	78.0±00	78.6±0.6	76.6±1.3	84.6±1.3
<b>PR 118</b>	84.0±3.9	78.6±2.6	79.3±0.6	78.6±0.6	80.0±00
<b>PR 120</b>	95.3±2.6	84.6±1.3	96.6±0.6	96.6±0.6	92.6±0.6
<b>PR 201</b>	90.6±0.6	76.0±1.9	77.3±0.6	82.0±1.9	87.3±1.3
<b>Mean</b>	91.0±1.6	78.7±1.3	82.8±3.0	84.1±3.2	86.1±1.9

F.Ratio (Rows: BETWEEN VARIETIES)= 7.54

C.D at 5%=4.944

F.Ratio (Columns: BETWEEN TREATMENTS)= 8.57

C.D at 5%=4.513

**Table 2: Polyphenol content of raw and cooked rice cultivars (mg/100g)**

Varieties	Raw	Soaked	Pan cooked	Pressure cooked	Microwave cooked
<b>PR 111</b>	198.7±00	153.8±00	176.9±00	167.3±0	162.2±0.6
<b>PR 113</b>	222.4±1.3	155.7±00	178.6±0.6	158.7±0	157.7±00
<b>PR 116</b>	209.6±00	152.5±00	175.5±00	157.7±0	159.6±00
<b>PR 118</b>	201.9±00	154.1±0.6	187.7±00	155.8±0	155.8±00
<b>PR 120</b>	223.7±0.6	159.1±00	191.8±1.3	167.7±0	168.6±0.6

<b>PR 201</b>	213.5±00	160.5±0.6	190.0±00	167.8±0	166.7±00
<b>Mean</b>	211.6±9.4	155.9±4.4	183.4±3.0	162.5±1.7	162.3±1.8

F.Ratio (Rows: BETWEEN VARIETIES)=4.31

C.D at 5%= 6.99

F.Ratio (Columns: BETWEEN TREATMENTS)= 112.08

C.D at 5%= 6.38

**Table 3: Oxalic acid content of raw and cooked rice cultivars (mg/100g)**

Varieties	Raw	Soaked	Pan cooked	Pressure cooked	Microwave cooked
<b>PR 111</b>	3.60±00	3.15±.44	2.70±00	3.60±00	3.15±.44
<b>PR 113</b>	3.15±.44	1.80±00	1.80±00	2.70±00	2.25±.44
<b>PR 116</b>	3.60±00	1.80±00	2.70±00	3.15±.44	2.25±.44
<b>PR 118</b>	2.70±00	2.70±00	2.25±.44	2.70±00	2.25±.44
<b>PR 120</b>	3.15±.44	2.70±00	2.25±.44	2.70±00	2.70±00
<b>PR 201</b>	3.60±00	2.70±00	2.25±.44	3.60±00	2.70±00
<b>Mean</b>	3.30±.15	2.50±.22	2.33±.13	3.08±.18	2.55±.15

F.Ratio (Rows: BETWEEN VARIETIES)=5.56

C.D at 5%=0.401

F.Ratio (Columns: BETWEEN TREATMENTS)= 11.42

C.D at 5%=0.366

**Table 4.: Zinc content of raw and cooked rice cultivars (mg/100g)**

Varieties	Raw	Soaked	Pan cooked	Pressure cooked	Microwave cooked
<b>PR 111</b>	1.32±.03	1.27±.03	1.35±.03	1.37±00	1.35±.03
<b>PR 113</b>	1.12±.06	1.08±.06	1.18±.06	1.12±.06	1.18±.06

<b>PR 116</b>	1.29±.03	1.32±.03	1.40±0	1.35±.03	1.26±.03
<b>PR 118</b>	1.15±.03	1.07±.03	1.07±.03	1.29±.03	1.22±.03
<b>PR 120</b>	1.15±.09	1.10±.06	1.20±.03	1.18±00	1.18±.06
<b>PR 201</b>	1.25±.06	1.08±.06	1.12±.06	1.19±.03	1.12±.06
<b>Mean</b>	1.21±0.1	1.15±0.1	1.22±0.16	1.25±0.1	1.22±0.1

F.Ratio (Rows: BETWEEN VARIETIES)= 14.68

C.D at 5%= 0.701

F.Ratio (Columns: BETWEEN TREATMENTS)= 2.65

C.D at 5%= NS

### Conclusion

There is significant difference between various treatments as compared to raw rice cultivars as well as varieties. By different cooking treatments including soaking, pan cooking, pressure cooking and microwave cooking the antinutritional factors like phytic acid, polyphenols and oxalic acid content are greatly reduced. Non- significant difference was found in case of total zinc with regard to cooking treatments as well as varieties.

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## 6. ELEMENTS OF MYSTICISM IN VERONIKA DECIDES TO DIE BY PAULO COELHO

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The etymology of the word 'Mysticism' goes into the Greek roots which means 'I conceal'. However, the further evolution and from its derivative "mystikos" meaning "an initiate", the modern word holds the meaning "to make someone aware of something". In the contemporary world the thing which is most sought after even before materialistic happiness, in a long run, is the meaning and purpose of human life and the path of oneness with the universe.

Mysticism has been defined by various scholars including Jalāl ad-Dīn Muhammad Rūmī who was a renowned poet from Persia, now Iran [1]. *Mysticism has always been a major source of study as it focuses on the purpose of life and the art of living it.*

*In the words of Sisirkumar Ghose from his book titled 'Mysticism', "Mysticism has its own image of man and human destiny. Perhaps the best definition of man is that he is the possible. An exciting, inevitable awakening or self-discovery, mysticism, still in via, spells his second birth: the outer apparent man has to become the inner real man." [1]. Moreover, it is a quest for a hidden truth; the one which is always in front of us yet has to be discovered with ardent toil.*

*Human life is not only precious but is also the only mean through which the super conscious can be achieved and thus, this establishes a strong link with the literature which is again a mirror image of life. One of the best statements of the mystical can be found in the theosophical text, 'Light on the Path': "Desire that which is within you/Desire that which is beyond you/Desire that which is unattainable". Similar efforts and statements have been put in works of William James [2], Sri Aurobindo Ghosh, Rajneesh Osho and even Emily Bronte in her famous work 'Wuthering Heights' when the heroine says "I am Heathcliff". Whenever any writer portrays the elements where the concept of oneness and living in the moment to understand the meaningfulness of the otherwise meaningless life can be categorised as a mystical work and the writer as a mystical writer [3].*

*Paulo Coelho is one such writer who has yet not been categorised as a mystical writer, however, his works have clear elements of mysticism. Some of his famous works are Veronika Decided to Die, The Pilgrimage, The Alchemist, The Fifth Mountain to name a few. In Veronika Decides to Die, he writes "Human being is unique, each with their own qualities, instincts, forms of pleasure and desire for adventure [3]. However, society imposes some rules on us a collective way of behaving", "It is if you force yourself to be the same as everyone else: it causes neuroses, psychoses and paranoia." This signifies that human life is not focused on the worldly-wise things but on something else.*

*On further going deeper on the way to reach the source in the same novel he mentions, "What was Sufi Meditation? What was God? What was salvation- and outside Vilete too-just lived their lives and let*



*others do the same, God would be in every moment, in every grain of mustard, in the fragment of cloud that is there and then gone the following moment.” The path of reaching the source itself has been discussed in his works.*

## **2. Scope of the study**

*The scope of this study is to understand the elements of mysticism and to further analyse some of the selected works of Paulo Coelho under the lens of mysticism. Mysticism is more than required, especially in the contemporary era where vast study is being done on Artificial Intelligence and virtual reality while real emphasis is required to study the soulful intelligence of human life and its very own existence [3]. Paulo Coelho, whose novels are being studied for the emotional and motivational stories providing some solace.*

*This study will mainly focus on looking for the elements of mysticism in the works of Paulo Coelho specifically in ‘Veronika Decides to die’ and the work can be extrapolated to study these elements from Coelho’s perspective.*

*The novel has the gist that collective madness is called sanity, and this is the actual scenario in the 21<sup>st</sup> century. Hence, a mystic would look for the actual purpose of life beyond the crowds and what this world does not consider as sane.*

## **3. Elements of mysticism**

***“The two hardest tests on the spiritual road are the patience to wait for the right moment and the courage not to be disappointed with what we encounter.”***  
 Life is what it is and has to be accepted the way things are, however, the contemporary era is all about competition and running behind the tangible. The importance of the present moment is ignored by the masses and with the above mentioned quote which hints the elements of mysticism. The state of bliss or enlightenment is considered by many as something extraordinary while the fact is that it is the most ordinary thing. This could be the reason it cannot be noticed by the intellectuals around the world.

***“People never learn anything by being told, they have to find out for themselves.”***  
 A similar saying is there in Hindi which states that to see the heaven, oneself has to die and be there. So, is the quote by Coelho which means the same that the path of mysticism cannot be taught or learnt but can be experienced only by travelling on it. Similar approach has been used by some other teachers as well and it has been stated that a learner learns better when performs the task independently.

***“Be crazy! But learn how to be crazy without being the center of attention. Be brave enough to live different.”***

The purpose of life has been lost because the masses are running after the materialistic happiness and the case is the same with vast majority. Hence, the one which has to be sought can be found only through madness and craziness. Including with this people those who follow their passions are either considered to be crazy or have to alienate themselves from the world that they are considered to be crazy. However, this is the only way which can lead the human conscious to its source.

*“You are someone who is different, but who wants to be the same as everyone else. And that in my view is a serious illness. God chose you to be different. Why are you disappointing God with this kind of attitude?”*

Every individual is born with a unique DNA and has a specific purpose for life, yet as mentioned earlier the human race is trying to bring uniformity, a culture which has to be followed; rules which must be abode by the masses, failing to do so might make you sound like a lunatic. This human consciousness is not and cannot be so trivial that it depends upon such patterns and rules.

*“You have two choices, to control your mind or to let your mind control you.”*

The path of mysticism can be travelled through mind. This is the intangible and therefore, mind plays a crucial role. Being in the moment and mindfulness which are considered to be the tools of mysticism are stages of human mind. Either the thoughts have to be controlled otherwise human mind can stride into a loop of holes and can even divert the consciousness into a whirlpool of thoughts.

*“Haven't you learned anything, not even with the approach of death? Stop thinking all the time that you're in the way, that you're bothering the person next to you. If people don't like it, they can complain. And if they don't have the courage to complain, that's their problem”*

The human mind consistently thinks about what the others are thinking and saying about him/her and while brooding over the matter, the person misses the present moment. The basic purpose of human life is to stay in the present and not to unnecessarily worry

*“Nothing in this world happens by chance”*

There is a design behind everything the super consciousness has architected with utmost efficiency and perfection. Human mind might fail to visualize and understand the plan but eventually when destiny unfolds only then the beautiful picture of life can be seen.

**Conclusion:** Considering the aforementioned quotes from the book of Paulo Coelho and the elements of mysticism which it covers, the efforts to connect the human life with the higher realms of consciousness suggests that “Veronika Decides to die” is a mystic novel and Paulo Coelho has eloquently used the language to discuss the mass insanity as sanity to incorporate the same.

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## 7. Demonetization: Is it fruitful?

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### Abstract

Indian economy is basically cash-based economy. India is ill-destined with widespread corruption and mounting black money. There is lack of transparency and accountability in the country. High rate of inflation prevails in it. Fake currency is being used to provide funds to spread militant terror by terrorists. With the intention of getting out of these problems, Govt. of India followed a step by step system. Firstly Govt. announced Jan Dhan Yojana for opening new bank accounts. People were asked to deposit their money in Jan Dhan accounts. Next step of Govt. was declaration of deadline October 30, 2016 for tax declaration of income. Thereafter, PM Narendra Modi announced Demonetization on 8<sup>th</sup> Nov., 2017. Demonetization implies banning of old currency notes and generation of new currency notes in circulation in the economy. This paper aims at throwing light on the history of demonetization in India and analyzing the impact of latest demonetization on Indian economy.

**Key-words:** Black Money, Transparency, Accountability, Fake currency

### Introduction

Independence of India in 1947 freed it from the shackles of slavery of British Govt. But there are some other shackles in which Indian economy is entangled, i.e., corruption, black money, fake money and terrorist attacks. Moreover, Indians still believe in cash-based transactions. However, if India wants to face international trade competition and to be in the front line on international levels, it must be freed from above mentioned problems. With the intention of getting out of these problems, Govt. of India followed a step by step system including demonetization. Demonetization means replacing the current currency with a new currency. Latest demonetization has appeared as a shock and surprise to the people.

### Review of Literature

**Tax Research Team (2016)** in their working paper mentioned that demonetization brings growth in economy. The working paper explored the impact of demonetization on credit availability, spending, level of activity and government finances.

**K. Veerakumar (2017)** observed that demonetization appears as a big shock for the economy. It has been undertaken to curb parallel economy and to stop militant activities in the country by bringing into light fake currency. Demonetization has resulted in alternative methods of payments i.e. digital transactions.

**Khatik, S.K. (2018)** attempted to find out the effect of demonetization on common people. Result of the study was that demonetization has both positive and negative effect on the people. Further, there has been improvement in the use of digital modes of payments after demonetization. It was also found out that the impact of demonetization was more in the starting years and later on its impact on the economy got reduced.

## **OBJECTIVES OF PAPER**

Main objectives of this paper are:

- To throw light on history of demonetization in India
- To analyze the impact of latest demonetization in India

## **History of Demonetization in India**

### **➤ Demonetization in 1946:**

First demonetization in India was done in 1946. Notes of Rs. 1,000 and Rs. 10,000 were banned. But this removal of currency notes from circulation did not affect the common man to a large extent. Reason was that such higher denomination notes were not accessible to the common man of India. Both of these notes were again brought into circulation in 1954.

### **➤ Demonetization in 1978:**

In 1954, the currency note of Rs. 5,000 was introduced in Indian economy. However, in 1978 currency notes of Rs. 1000, Rs. 5000 and Rs. 10,000 were banned by the then Prime Minister Morarji Desai. Objective behind this ban was to check black money circulation. This ban also did not have much effect on the people. It affected only the privilege few. Reason behind this was that this demonetization did not have the support of RBI Governor. The then Governor I.G. Patel was of the view that the motive behind demonetization by the ruling party was to immobilize the funds of opposition party.

## **Latest Demonetization**

Latest demonetization has been announced by Prime Minister of India on 8<sup>th</sup> November, 2016 in a live televised address to the country people. The result was invalidation of currency notes of Rs. 500 and Rs. 1000 from midnight of that very day and announcement of issuance of new banknotes of Rs. 500 and Rs. 2000.

## **Underlying Purposes of current Demonetization**

Two main purposes behind the move were:

### ➤ Counter-terrorism Purpose:

Due to faked currency in circulation, supply of notes of all denominations has increased in the economy. According to statements of Governor of RBI, Urjit Patel and Secretary of Economic Affairs, Shasikanta Das, supply of banknotes of Rs. 500 had increased by 76% and that of Rs. 1000 notes had increased by 109% due to fake currency. Moreover this fake currency had been used for terrorism against India. Decision of demonetization has been made for counter-terrorism purpose.

### ➤ Curbing Black Money:

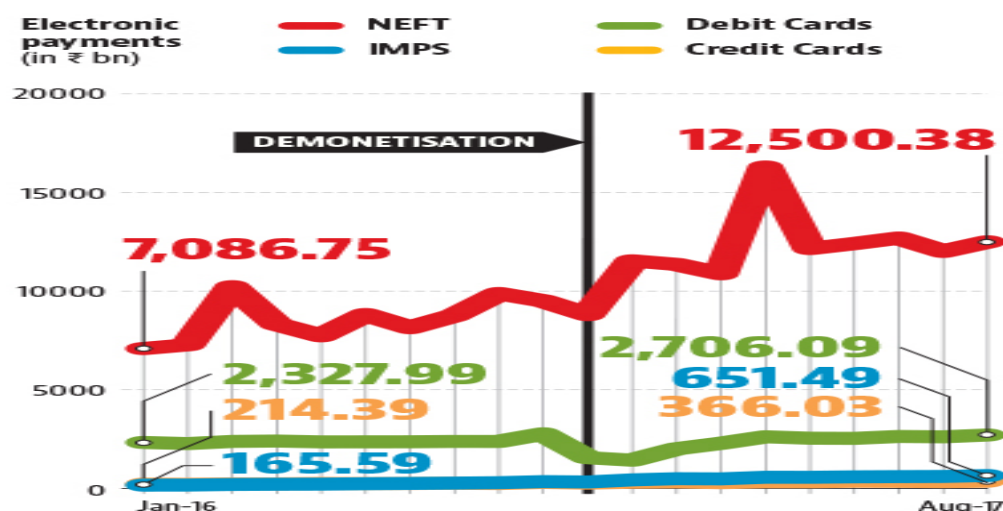
Second main motive was to curb black money. Dishonest tax payers were not paying taxes fully and hoarding black money. Demonetization would make it necessary to replace the currency. As a result, corrupt and dishonest people would come to light. If not, their black money would be worthless paper.

## IMPACT OF DEMONETIZATION

### AREAS IN WHICH DEMONETIZATION HAS BROUGHT LAURELS:

Demonetization has done a lot of good for the economy.

- **Boost to Digital Payments:** Demonetization 2016 has pushed India much faster towards digital adoption. Instead of using cash, more people have started using Mobile wallets for making payments for their regular needs. Even less educated people have learned and switched over to mobile transactions. Grocer, baker, veggie vendor, chemist are more willing to accept digital money. Reserve Bank of India statistics show that UPI (Unified Payments Interface) grew at a compounded monthly rate of over 100% in the first 6 months following demonetization, boosting the market of digital payments. M-wallet firms like Paytm, Freecharge and Mobikwik announced major expansion plans soon after demonetization partnering with cab operators, vegetable vendors and kirana stores for digital payment. Consumers in both B2C and B2B space are more digital savvy and opting for hassle-free methods of transaction. Digital technology and digital-based governance are now taking a forefront.

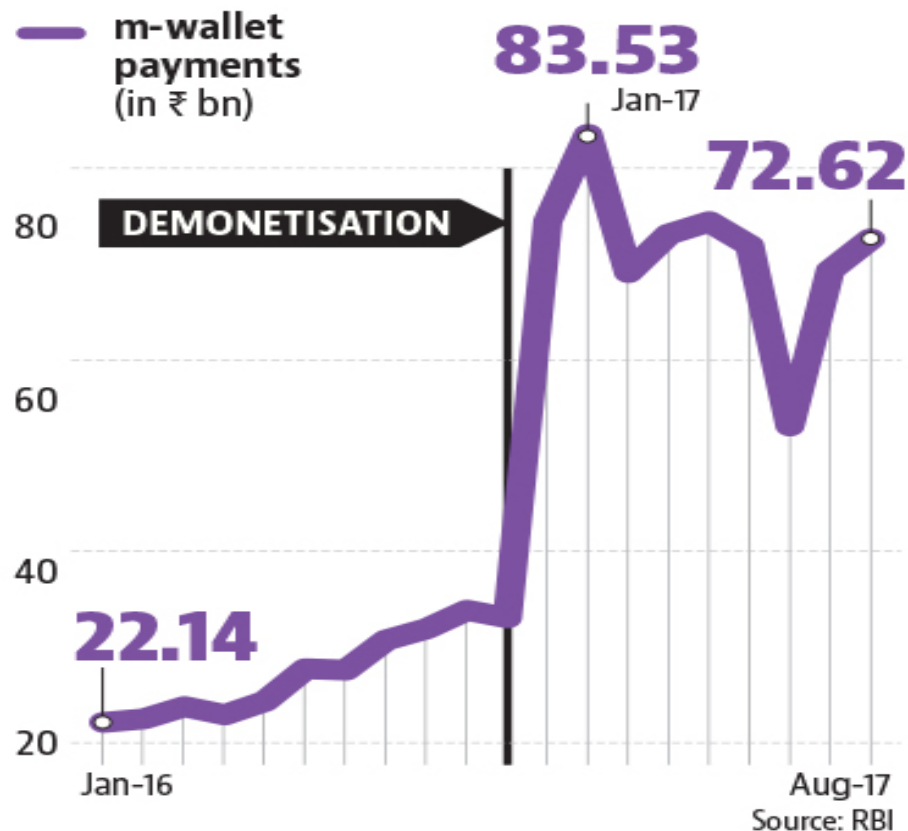


Source: RBI

As per details of growth of digital transactions shared by RBI, it is clear that since January 2016 to August 2017:

- NEFT transactions that involved Rs. 7086 bn increased to Rs.12500 bn;
- Debit cards transactions increased from Rs.2328 bn to Rs. 2700 bn;
- Credit cards from Rs. 214 bn to Rs.366bn; and
- The IMPS transaction which was not used by the people got a share of Rs.651 bn.

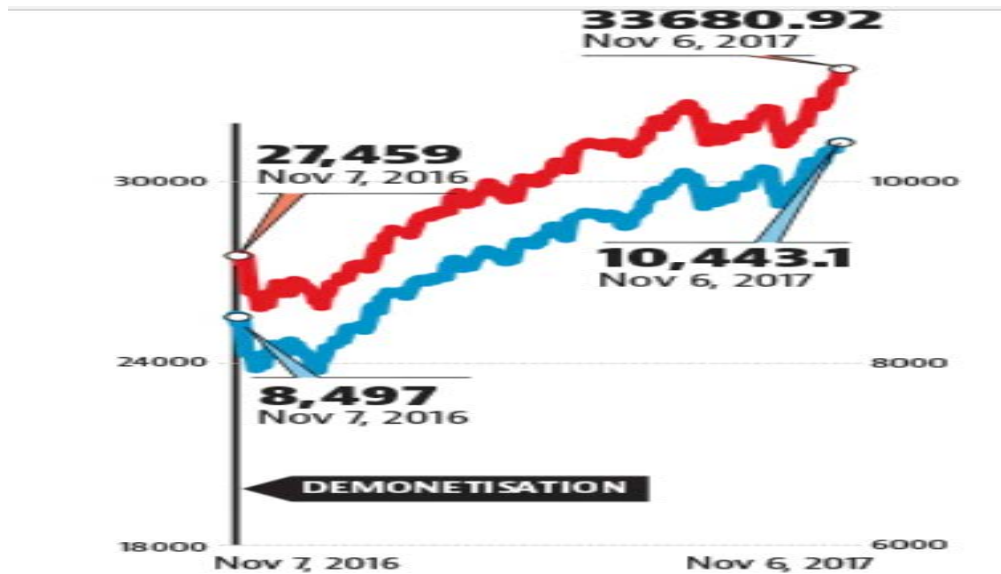
As per RBI, after the note-ban, overall digital transactions rose 31% from November 2016 to September 2017. The volume of transactions which was Rs.22.14 bn in January 2016 had gone up to Rs. 83.53bn in January 2017.



Demonetization initiative has been a boon for India's e-payment providers. The lack of cash in the economy combined with the buzz around electronic payments systems has also sparked some very innovative solutions. The farmers' markets of Telangana began experimenting with their own electronic payment system where customers with Aadhar-linked bank accounts could buy vegetables using tokens which could be purchased via debit cards at specialized kiosks. These changes indicate towards a more inclusive society in the future.

- **Decisive blow to terrorism and naxalism:**  
In Naxal-affected states, terror incidents are down 45 per cent, according to data from the South Asia Terrorism Portal or SATP.
- **Stock Market gets bullish**  
After demonetization stock market in India got bullish.

— BSE Sensex  
— NIFTY

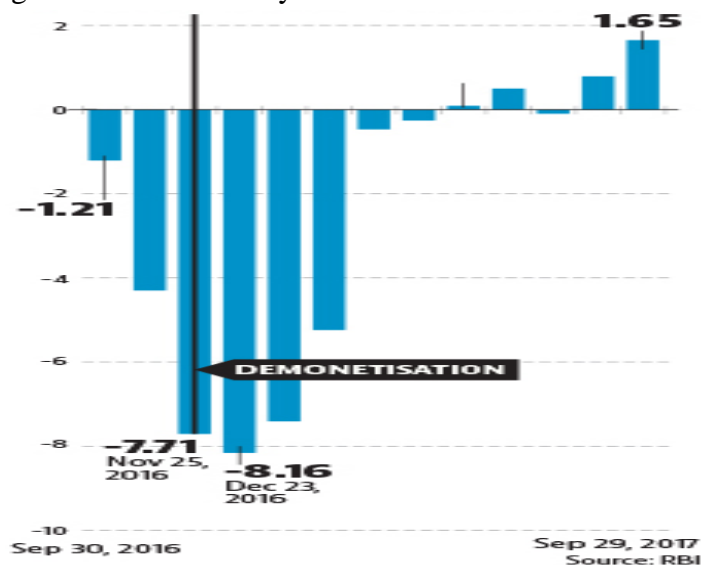


Source: Bloomberg

Above graph shows that while BSE index which was 27, 459 on November 7, 2016 rose to 33680.92 on November 6, 2017, the NSE rose from 8497 to 10,443.

▪ **Banks’ lending increases for small businesses**

Banks’ finance to small business was going down in pre-demonetization period. There was a negative growth even in short period of months. As on November 25, 2016, a negative growth of -7.71% was recorded in Banks’ lending to small business. It went to -8.16% as on December 23, 2016. However, as on September 29, 2017 the Reserve Bank of India has reported a positive growth of 1.65% in lending to small business by the Banks.

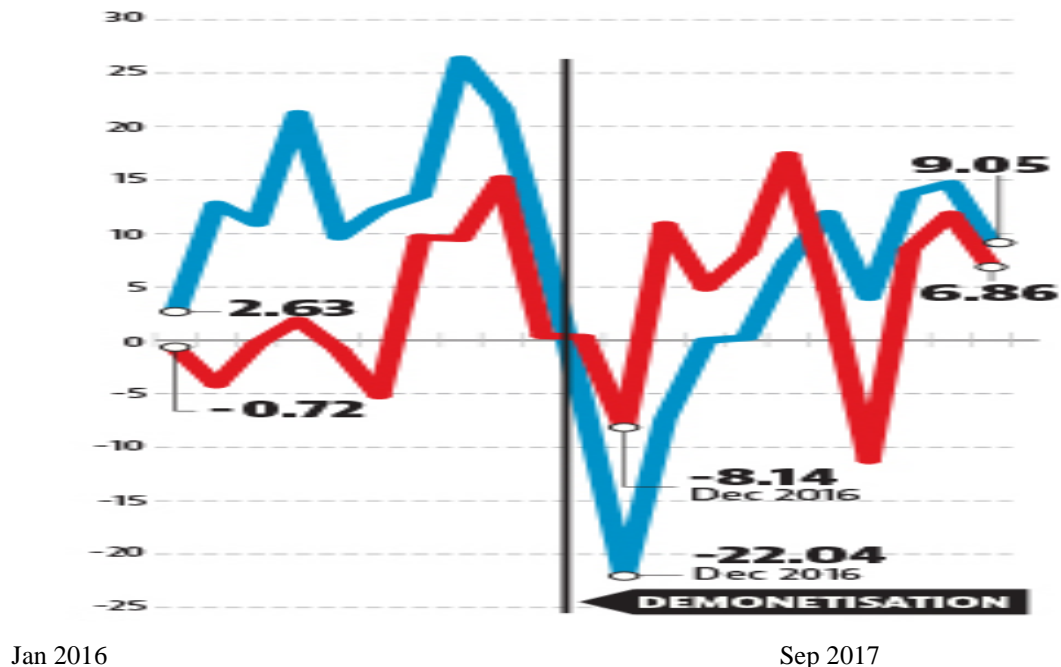


(Bank Lending to MSME Y-o-Y Growth in %)

### ➤ Automobile sales picked up

Sale of 2 wheelers and 4 wheelers was showing a negative growth in 2016. In 2017 it went up substantially and recovered from the impact of negative growth to high positive growth as reflected in the report.

--Passenger Car Sales, --Two-Wheeler Sales  
Year-on-Year Growth in %



Source: CMIE

## FAILURES OF DEMONETIZATION

- Mounting of Huge Expenses:**  
Gains were few but huge expenses had to be incurred for implementation of demonetization. Old currency notes had to be destroyed and giant cost had to be incurred in printing new notes.
- Spending hours in long queues to withdraw money led to deaths:** In the weeks and months after November 8th, 2016, Indians cutting across all lines—rich and poor, urban and rural—formed serpentine queues to deposit money and get hold of some precious but rationed cash for much-needed daily use.
- Distress to Agriculture Sector:**  
Demonetization wrecked the primarily cash-reliant rural economy, adding distress to mounting debts. The agricultural sector which is behind in reforms and investment worsened due to cash shortages, plunging demand and collapsing prices. Prices of potatoes, onions and tomatoes were half of what they had been a year before in January-February. The outcome was widespread suffering and farmer unrest in the states of Madhya Pradesh, Maharashtra, Gujarat, Tamil Nadu and Rajasthan.

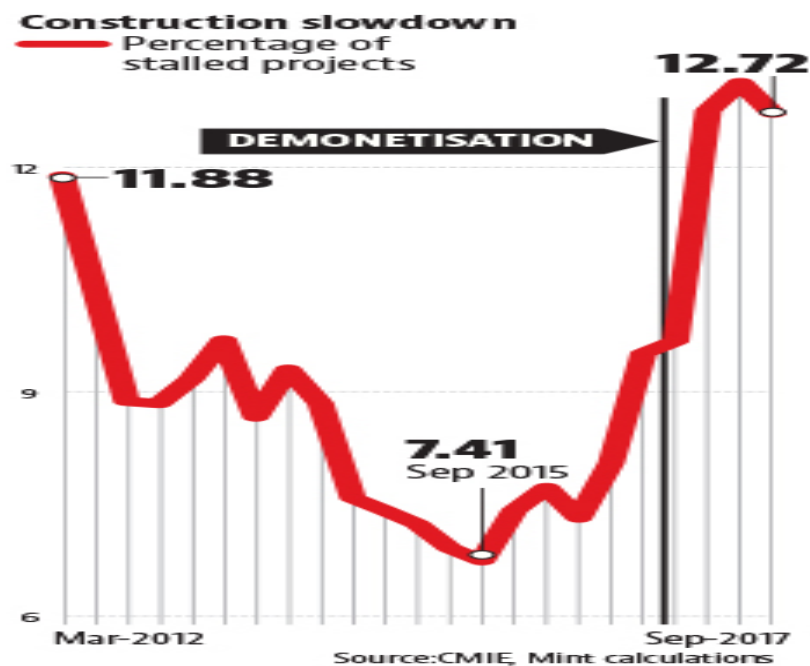


- **Distress to Industrial Sector:**

The downturn spilled over to other sectors. The [Reserve Bank of India's Annual Report](#) (RBI) stated that industry slowed down. A survey by [India Development Foundation](#) found that production took a hit due to demonetization. In Mumbai, more than 50% of the power loom units were shut down, impacting around [300,000 workers](#).

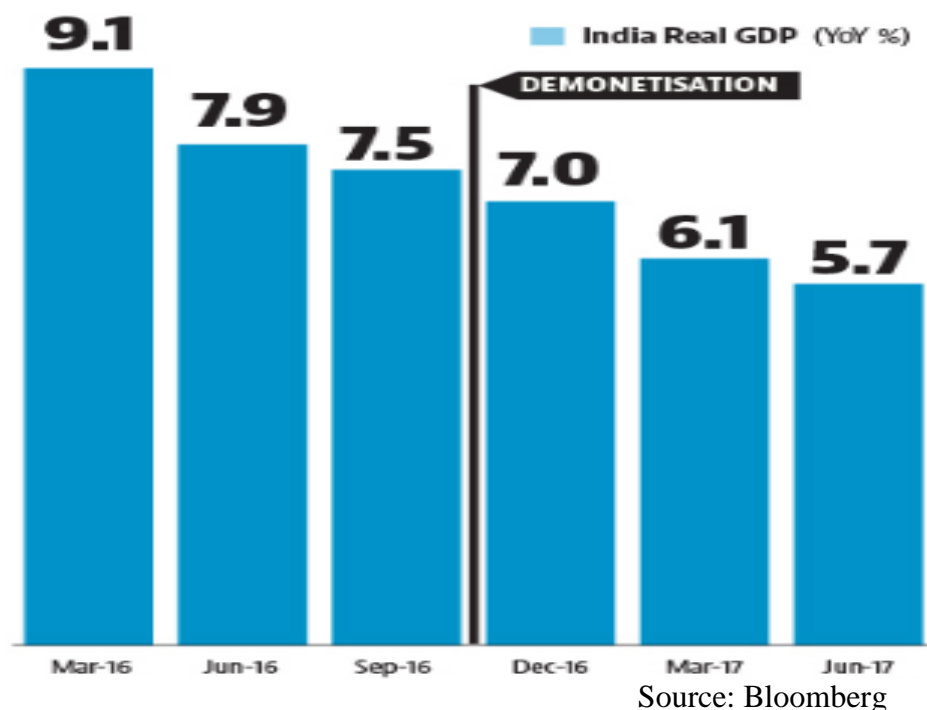
- **Distress to Real Estate sector**

Demonetization resulted in slowdown of construction activities. The construction sector registered [negative gross value added growth](#). The supply of new housing units in the top-6 cities in India during the first three quarters of 2017 was down by around 60 per cent, compared with the corresponding period of 2016.



Property transactions in the secondary sales and luxury housing segments tended to have significant cash components, and such sales have been hampered significantly due to demonetization. However, the shadow of Demonetization now appears to be fading in reality sector. The prevailing attractive home loan rates, flexible payment plans and other attractive offers by developers, coupled with restricted new supply addition, has led to a steady decline in the unsold inventory. As of Q3 2017, only 6,38,500 units remained unsold in the top-6 cities, registering a 9 per cent decline from Q4 2016 levels. The demand for affordable and mid-segment housing has been on a rise.

- **Loss of Jobs due to demonetization:** Within 4 months of demonetization, more than 15 lacs people losses their job. Labourers from Delhi have been compelled to leave National Capital Territory after demonetization as they are unable to get money.
- **Economic Growth slows down**  
Post demonetization growth of Indian Economy slowed down from 7.0% to 5.7% in less than one year. Month-wise GDP growth chart for the period March 2016 to September 2017 emphasizes this fact as detailed below:



- **Circulation of New Fake Currency**

It was told that demonetization will affect fake currency most. However after 3–4 days of demonetization, news was all around about the new fake currency notes. The government's freshly minted 2,000-rupee notes, issued after demonetization, are already being counterfeited. 11.23 cr is the detected fake currency notes. If this is so, there must be undetected new fake currency also. This shows that demonetization has zero impact on the fake currency.

- **Continuation of Terror Funding**

It was also told that demonetization will also affect terror funding. But within 1 month of demonetization, many attacks occurred. In Assam attack on 19<sup>th</sup> Nov. 2017, 3 soldiers were killed and 4 were injured. On 29<sup>th</sup> Nov. 2017, 7 soldiers including 2 officers were killed in militant attack on Nagrota Army Camp.

- **Failure to Recover Black Money:**

In August 2017 a report of RBI mentioned that 99% of the Demonetized notes are returned back to the bank. It means that hoarders of black money are successful in converting their old currency notes of Rs. 500 and Rs. 1000 with the currency in circulation. It shows loopholes in the scheme of demonetization and people have exploited these loopholes.

## Conclusion

Demonetization announced by PM Narendra Modi was perhaps India's boldest policy experiment in over a quarter century. After one year of its implementation, demonetization has created mixed reaction on the risky policy of Government of India and its impact on Indian Economy. Different sectors have felt the impact of demonetization.

Govt. reports that demonetization will not only help millions of Indians overcome the hassles of dealing in cash but also act as a significant step towards propelling India to emerge as a truly cashless economy.

Critics are of the view that digital transactions has not started in India due to demonetization. It has started much earlier in India. When demonetization occurred there was sudden growth in cashless payments but it was due to the fact that there was less money available into the market but when the money started coming back the cashless payments were dropped till Feb or March. The demonetization move was criticized as not well planned and unfair, and was met with protests, litigation, and strikes.

But now the lingering effects of draining out cash have worn-off. If these had persisted, they would have shown up in the political domain, for no government can escape public wrath at a policy miscalculation on such a scale. In case the effects of the draining out cash were as acute as portrayed by critics, then surely there would have been political reversals for the ruling party. There has been none so far.

The banning of large-denomination notes of Rs. 1000 and Rs. 500 was supposed to be a one- time attack on black money. However, curbing of black money requires more time. As mentioned by the Finance Minister, the number of suspect deposits is very large. Scrutiny by tax officials and the use of data-mining methods to spot irregularities will bring black money into light. How the Government balances the twin objectives of unearthing black money and safeguarding innocents from mistreatment is something to watch out for. The trouble is that demonetization is looked at in isolation. But in reality, it was only one in a series of steps taken by Govt. meant to modernize the Indian economy and reduce the corruption that has moved wheels in India for too long. What happens in the future cannot be known, of course, but an attempt has been made.

Whether demonetization will yield long-term benefits or not, it depends on the implementation of other policies of government to fight black money and corruption and how well it succeeds in accelerating progress towards financial inclusion.

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